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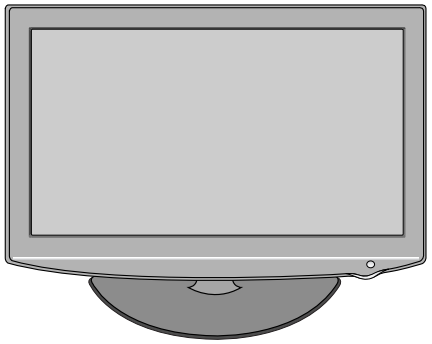
LCD TV
SERVICE MANUAL

CHASSIS : LD91A

MODEL : 32LD320 32LD320-ZA
32LD320N 32LD320N-ZA

CAUTION
BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



P/NO : MFL50326844 (1004-REV00)

Printed in Korea

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SVC. SHEET .....

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SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and Exploded View.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.

General Guidance

An **isolation Transformer should always be used** during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and it's components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1 W), keep the resistor 10mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

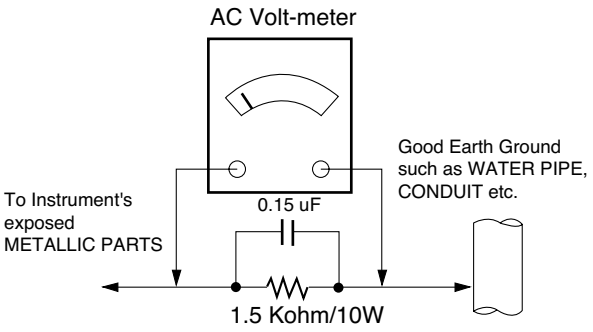
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)
With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.
If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1 MΩ and 5.2 MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)
Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.
Connect 1.5 K / 10 watt resistor in parallel with a 0.15 uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5 mA.
In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1 Ω
*Base on Adjustment standard

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SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the SAFETY PRECAUTIONS on page 3 of this publication.
NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
   CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe.
   Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10 % (by volume) Acetone and 90 % (by volume) isopropyl alcohol (90 % - 99 % strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
8. Use with this receiver only the test fixtures specified in this service manual.
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500 °F to 600 °F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25 cm) brush with a metal handle.
   Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature. (500 °F to 600 °F)
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach a normal temperature (500 °F to 600 °F)
   b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
   c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
   d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

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IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.
   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.
   CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

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SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. Application range

This specification is applied to the LCD TV used LD91A chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

1) Temperature: 25 ºC ± 5 ºC(77 ºF ± 9 ºF), CST: 40 ºC ± 5 ºC
2) Relative Humidity : 65 % ± 10%
3) Power Voltage
   : Standard input voltage (AC 100-240 V~, 50 / 60Hz)
   * Standard Voltage of each products is marked by models.
4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
5) The receiver must be operated for about 5 minutes prior to the adjustment.

3. Test method

1) Performance: LGE TV test method followed
2) Demanded other specification
   - Safety: CE, IEC specification
   - EMC:CE, IEC

4. Component Video Input (Y, CB/PB, CR/PR)

No.	Specification				Remark
	Resolution	H-freq.(kHz)	V-freq.(Hz)		
1.	720x480	15.73	60.00	SDTV,DVD 480i	
2.	720x480	15.63	59.94	SDTV,DVD 480i	
3.	720x480	31.47	59.94	480p	
4.	720x480	31.50	60.00	480p	
5.	720x576	15.625	50.00	SDTV,DVD 625 Line	
6.	720x576	31.25	50.00	HDTV 576p	
7.	1280x720	45.00	50.00	HDTV 720p	
8.	1280x720	44.96	59.94	HDTV 720p	
9.	1280x720	45.00	60.00	HDTV 720p	
10.	1920x1080	31.25	50.00	HDTV 1080i	
11.	1920x1080	33.75	60.00	HDTV 1080i	
12.	1920x1080	33.72	59.94	HDTV 1080i	
13.	1920x1080	56.250	50	HDTV 1080p	
14.	1920x1080	67.5	60	HDTV 1080p	

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5. RGB (PC)

No	Specification				Proposed	Remark
	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel Clock(MHz)		
1.	720*400	31.468	70.08	28.321		For only DOS mode
2.	640*480	31.469	59.94	25.17	VESA	Input 848*480 60 Hz, 852*480 60 Hz -> 640*480 60 Hz Display
3.	800*600	37.879	60.31	40.00	VESA	
4.	1024*768	48.363	60.00	65.00	VESA(XGA)	
5.	1280*768	47.78	59.87	79.5	WXGA	
6.	1360*768	47.72	59.8	84.75	WXGA	
7.	1280*1024	63.595	60.0	108.875	SXGA	FHD model
8.	1920*1080	66.587	59.93	138.625	WUXGA	FHD model

6. HDMI Input (PC/DTV)

(1) DTV Mode

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1.	720*480	31.469 /31.5	59.94 /60	27.00/27.03	SDTV 480P	
2.	720*576	31.25	50	54	SDTV 576P	
3.	1280*720	37.500	50	74.25	HDTV 720P	
4.	1280*720	44.96 /45	59.94 /60	74.17/74.25	HDTV 720P	
5.	1920*1080	33.72 /33.75	59.94 /60	74.17/74.25	HDTV 1080I	
6.	1920*1080	28.125	50.00	74.25	HDTV 1080I	
7.	1920*1080	26.97 /27	23.97 /24	74.17/74.25	HDTV 1080P	
8.	1920*1080	33.716 /33.75	29.976 /30.00	74.25	HDTV 1080P	
9.	1920*1080	56.250	50	148.5	HDTV 1080P	
10.	1920*1080	67.43 /67.5	59.94 /60	148.35/148.50	HDTV 1080P	

(2) PC Mode

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1.	720*400	31.468	70.08	28.321		HDCP
2.	640*480	31.469	59.94	25.17	VESA	HDCP
3.	800*600	37.879	60.31	40.00	VESA	HDCP
4.	1024*768	48.363	60.00	65.00	VESA(XGA)	HDCP
5.	1280*768	47.78	59.87	79.5	WXGA	HDCP
6.	1360*768	47.72	59.8	84.75	WXGA	HDCP
7.	1280*1024	63.595	60.0	108.875	SXGA	HDCP/FHD model
8.	1920*1080	67.5	60.00	138.625	WUXGA	HDCP/FHD model

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ADJUSTMENT INSTRUCTION

1. Application Range

This specification sheet is applied to all of the LCD TV with LD91A chassis.

2. Designation

1) The adjustment is according to the order which is designated and which must be followed, according to the plan which can be changed only on agreeing.
2) Power Adjustment: Free Voltage
3) Magnetic Field Condition: Nil.
4) Input signal Unit: Product Specification Standard
5) Reserve after operation: Above 5 Minutes (Heat Run)
   Temperature : at 25 °C ± 5 °C
   Relative humidity : 65 % ± 10 %
   Input voltage : 220 V, 60 Hz
6) Adjustment equipments: Color Analyzer (CA-210 or CA-110), DDC Adjustment Jig equipment, SVC remote controller
7) Push The “IN STOP” key - For memory initialization.

Case1 : Software version up
1. After downloading S/W by USB, TV set will reboot automatically
2. Push “In-stop” key
3. Push “Power on” key
4. Function inspection
5. After function inspection, Push “I n-stop” key.

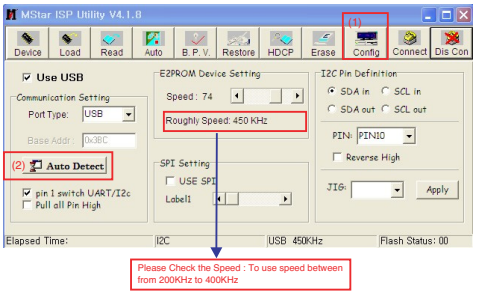
Case2 : Function check at the assembly line
1. When TV set is entering on the assembly line, Push “In-stop” key at first.
2. Push “Power on” key for turning it on.
   -> If you push “Power on” key, TV set will recover channel information by itself.
3. After function inspection, Push “In-stop” key.

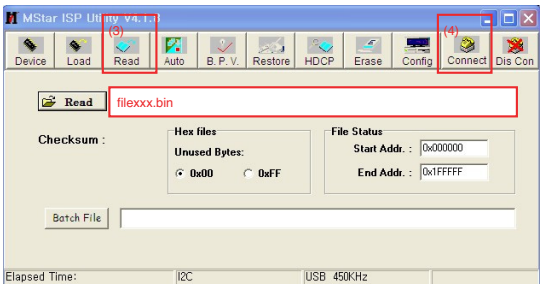
3. Main PCB check process

* APC - After Manual-Insult, executing APC

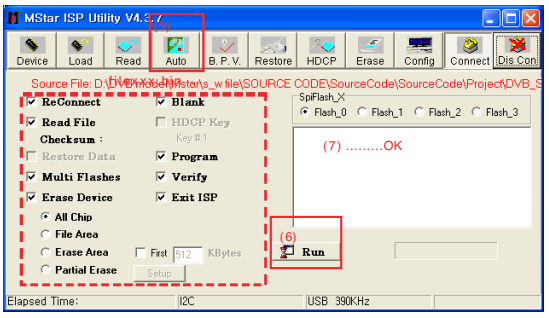
* Boot file Download

1) Execute ISP program “Mstar ISP Utility” and then click “Config” tab.
2) Set as below, and then click “Auto Detect” and check “OK” message
   If “Error” is displayed, Check connection between computer, jig, and set.
3) Click “Read” tab, and then load download file (XXXX.bin) by clicking “Read”



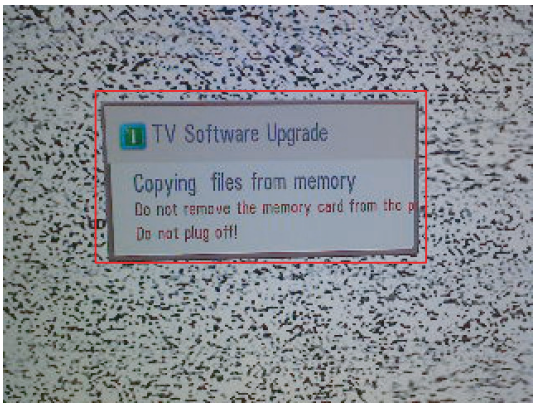


4. Click “Connect” tab. If “Can’t” is displayed, check connection between computer, jig, and set.
5. Click “Auto” tab and set as below
6. Click “Run”.
7. After downloading, check “OK” message.



* USB DOWNLOAD

1) Put the USB Stick to the USB socket
2) Automatically detecting update file in USB Stick
   - If your downloaded program version in USB Stick is Low, it didn’t work. But your downloaded version is High, USB data is automatically detecting
3) Show the message “Copying files from memory”



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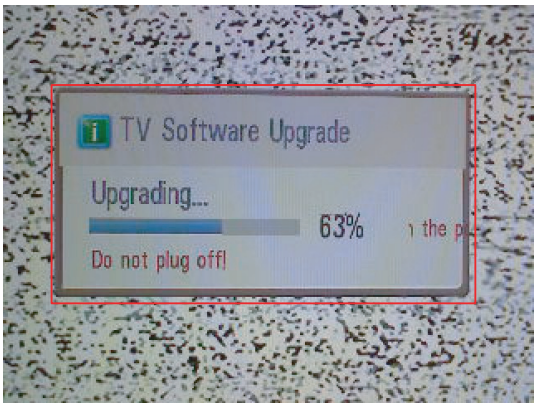
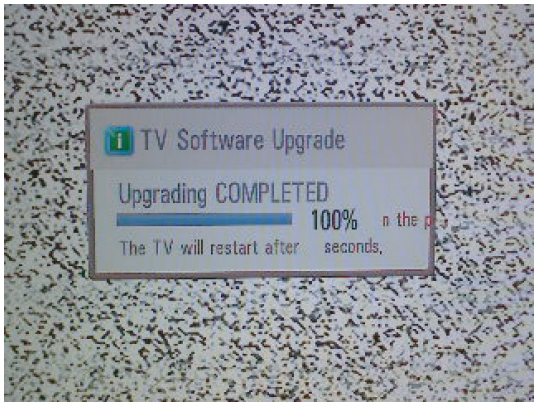
4) Updating is staring.



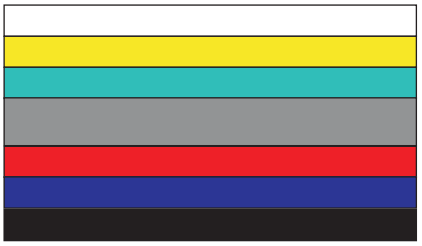


5) Fishing the version uploading, you have to put USB stick and “AC Power” off.
6) After putting “AC Power” on and check updated version on your TV.
   * If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. if all channel data is cleared, you didn’t have a DTV/ATV test on production line.

* After downloading, have to adjust Tool Option again.
1) Push "IN-START" key in service remote controller
2) Select “Tool Option 1” and push “OK” button.
3) Punch in the number. (Each model hax their number)
4) Completed selecting Tool option.

3.1. ADC Process

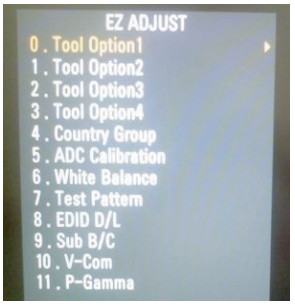
(1) ADC
- Input signal : Component 480i
- Signal equipment displays.



Adjustment pattern

- Component 480I
  MODEL: 209 in Pattern Generator(480i Mode)
  PATTERN : 65 in Pattern Generator(MSPG-925 SERIES)

- After enter Service Mode by pushing “ADJ” key,
- Enter Internal ADC mode by pushing “▶” key at “5. ADC Calibration”



<Caution> Using ‘power on’ button of the Adjustment R/C , power on TV.

* ADC Calibration Protocol (RS232)

Item	CMD1	CMD2	Data0		
Adjust ‘Mode In’	A	A	0	0	When transfer the ‘Mode In’, Carry the command.
ADC Adjust	A	D	1	0	Automatically adjustment (The use of a internal pattern)

Adjust Sequence
- aa 00 00 [Enter Adjust Mode]
- xb 00 40 [Component1 Input (480i)]
- ad 00 10 [Adjust 480i Comp1]
- xb 00 60 [RGB Input (1024*768)]
- ad 00 10 [Adjust 1024*768 RGB]
- aa 00 90 End Adjust mode

* Required equipment : Adjustment R/C.

3.2 Function Check

(1) Check display and sound
· Check Input and Signal items. (cf. work instructions)
1. TV
2. AV (SCART1/SCART2/ CVBS)
3. COMPONENT (480i)
4. RGB (PC : 1024 x 768 @ 60 Hz)
5. HDMI
6. PC Audio In

* Display and sound check is executed by Remote control.

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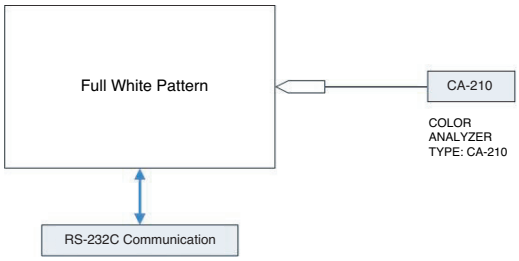
4. Total Assembly line process

4.1. Adjustment Preparation

· W/B Equipment condition
CA210 : CH 9, Test signal : Inner pattern (85IRE)
· Above 5 minutes H/run in the inner pattern. (“power on” key of adjust remote control)

Cool	9,300	ºK	X=0.285(±0.002)	<Test Signal> Inner pattern (216gray,85IRE)
			Y=0.293(±0.002)	
Medium	8,000	ºK	X=0.295(±0.002)	
			Y=0.305(±0.002)	
Warm	6,500	ºK	X=0.313(±0.002)	
			Y=0.329(±0.002)	

* Connecting picture of the measuring instrument
(On Automatic control)
Inside PATTERN is used when W/B is controlled. Connect to auto controller or push Adjustment R/C POWER ON -> Enter the mode of White-Balance, the pattern will come out



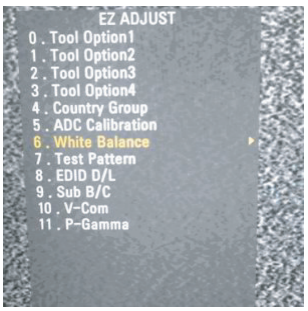
* Auto-control interface and directions
1) Adjust in the place where the influx of light like floodlight around is blocked. (illumination is less than 10 lux).
2) Adhere closely the Color Analyzer (CA-210) to the module less than 10 cm distance, keep it with the surface of the Module and Color Analyzer’s prove vertically.(80° ~ 100°).
3) Aging time
- After aging start, keep the power on (no suspension of power supply) and heat-run over 15minutes.
- Using ‘no signal’ or ‘full white pattern’ or the others, check the back light on.

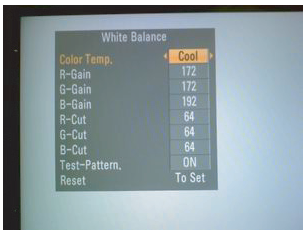
• Auto adjustment Map(RS-232C)

	RS-232C COMMAND [CMD ID DATA]			MIN	CENTER (DEFAULT)			MAX
	Cool	Mid	Warm		Cool	Mid	Warm	
R Gain	jg	Ja	jd	00	172	192	192	255
G Gain	jh	Jb	je	00	172	192	192	255
B Gain	ji	Jc	jf	00	192	192	172	255
R Cut					64	64	64	128
G Cut					64	64	64	128
B Cut					64	64	64	128

** Caution **
Color Temperature : COOL, Medium, Warm.
One of R Gain/G Gain/ B Gain should be kept on 0xC0, and adjust other two lower than C0.
(when R/G/B Gain are all C0, it is the FULL Dynamic Range of Module)

* Manual W/B process using adjusts Remote control.
• After enter Service Mode by pushing “ADJ” key,
• Enter White Balance by pushing “►” key at “3. White Balance”.





* After done all adjustments, Press “In-start” button and compare Tool option and Area option value with its BOM, if it is correctly same then unplug the AC cable. If it is not same, then correct it same with BOM and unplug AC cable. For correct it to the model’s module from factory JIG model.
* Push the “IN STOP” key after completing the function inspection.

4.2. DDC EDID Write (RGB 128Byte)

• Connect D-sub Signal Cable to D-sub Jack.
• Write EDID Data to EEPROM(24C02) by using DDC2B protocol.
• Check whether written EDID data is correct or not.
* For SVC main Ass’y, EDID have to be downloaded to Insert Process in advance.

4.3. DDC EDID Write (HDMI 256Byte)

• Connect HDMI Signal Cable to HDMI Jack.
• Write EDID Data to EEPROM(24C02) by using DDC2B protocol.
• Check whether written EDID data is correct or not.
* For SVC main Ass’y, EDID have to be downloaded to Insert Process in advance.

4.4. EDID DATA

1) All Data : HEXA Value
2) Changeable Data :
*: Serial No : Controlled / Data:01
**: Month : Controlled / Data:00
***:Year : Controlled
****:Check sum

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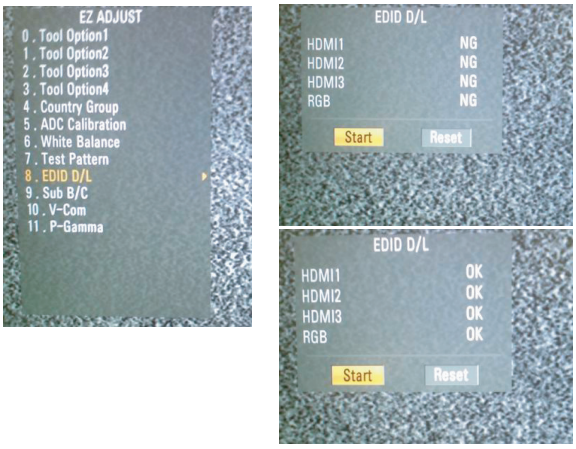
- Auto Download

- After enter Service Mode by pushing “ADJ” key,
- Enter EDID D/L mode.
- Enter “START” by pushing “OK” key.



* Edid data and Model option download (RS232)

Item	CMD1	CMD2	Data0		
Download ‘Mode In’	A	A	0	0	When transfer the ‘Mode In’, Carry the command.
Download	A	E	00	10	Automatically Download (The use of a internal pattern)

- Manual Download

* Caution

1) Use the proper signal cable for EDID Download
   - Analog EDID : Pin3 exists
   - Digital EDID : Pin3 exists
   - Never connect HDMI & D-sub Cable at the same time.
   - Use the proper cables below for EDID Writing
   - Download HDMI1, HDMI2, separately because HDMI1 is different from HDMI3

For Analog EDID	For HDMI EDID	
D-sub to D-sub	DVI-D to HDMI or HDMI to HDMI	

No.	Item	Condition	Hex Data
1	ManufacturerID	GSM	1E6D
2	Version	Digital : 1	01
3	Revision	Digital : 3	03

1) Analog Data 128Byte (2Bi)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	a		b			
10	c		01	03	80	73	41	78	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	A1	08	00	81	C0	61	40	45	40	31	40	01	01
30	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	7E	8A	42	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	7E	8A	42	00	00	1E	00	00	00	FD	00	3A
60	3E	1F	46	10	00	0A	20	20	20	20	20	20	d			
70	d														01	e
80	02	03	20	F1	4E	10	1F	84	13	05	14	03	02	12	20	21
90	22	15	01	26	15	07	50	09	57	07	f					
A0	f		80	18	71	1C	16	20	58	2C	25	00	7E	8A	42	00
B0	00	9E	01	1D	00	80	51	D0	0C	20	40	80	35	00	7E	8A
C0	42	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96	00
D0	7E	8A	42	00	00	18	02	3A	80	18	71	38	2D	40	58	2C
E0	45	00	7E	8A	42	00	00	1E	01	1D	80	D0	72	1C	16	20
F0	10	2C	25	80	7E	8A	42	00	00	9E	00	00	00	00	00	D5

2) DIGITAL DATA(HDMI-1/2/3/4) 256Byte

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	a		b			
10	c		01	03	80	73	41	78	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	A1	08	00	81	C0	61	40	45	40	31	40	01	01
30	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	7E	8A	42	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	7E	8A	42	00	00	1E	00	00	00	FD	00	3A
60	3E	1F	46	10	00	0A	20	20	20	20	20	20	d			
70	d														01	e
80	02	03	20	F1	4E	10	1F	84	13	05	14	03	02	12	20	21
90	22	15	01	26	15	07	50	09	57	07	f					
A0	f		80	18	71	1C	16	20	58	2C	25	00	7E	8A	42	00
B0	00	9E	01	1D	00	80	51	D0	0C	20	40	80	35	00	7E	8A
C0	42	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96	00
D0	7E	8A	42	00	00	18	02	3A	80	18	71	38	2D	40	58	2C
E0	45	00	7E	8A	42	00	00	1E	01	1D	80	D0	72	1C	16	20
F0	10	2C	25	80	7E	8A	42	00	00	9E	00	00	00	00	00	D5

* Detail EDID Options are below

ⓐ Product ID

Model Name	HEX	EDID Table	DDC Function
FHD Model	0001	01 00	Analog/Digital
HD Model	0000	00 00	Analog/Digital

ⓑ Serial No: Controlled on production line.

ⓒ Month, Year: Controlled on production line:
ex) Monthly : ‘09’ -> ‘09’
Year : ‘2006’ -> ‘10’

ⓓ Model Name(Hex):

MODEL	MODEL NAME(HEX)
all	00 00 00 FC 00 4C 47 20 54 56 0A 20 20 20 20 20 20 20

ⓔ Checksum: Changeable by total EDID data.

ⓕ Vendor Specific(HDMI)

INPUT	MODEL NAME(HEX)
HDMI1	67030C001000011D
HDMI2	67030C002000011D
HDMI3	67030C003000011D

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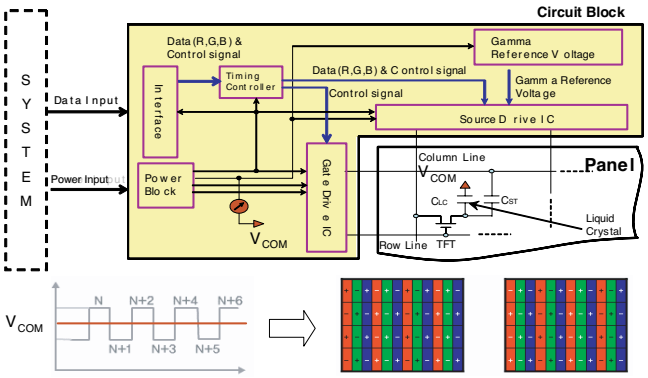
4.5. V-COM Adjust(Only 37/42/47LH4000-ZA)

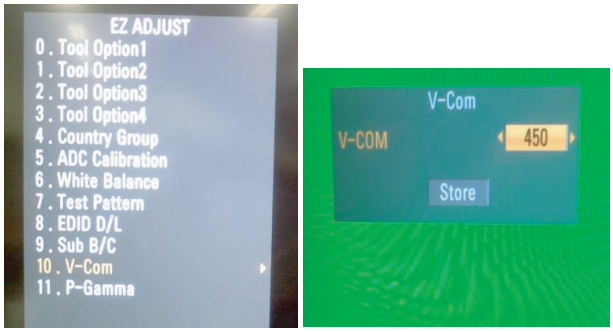
- Why need Vcom adjustment?

■ The Vcom (Common Voltage) is a Reference Voltage of Liquid Crystal Driving.

-> Liquid Crystal need for Polarity Change with every frame.



- Adjust sequence
  - · After enter Service Mode by pushing “ADJ” key.
  - · Enter V-Com Adjust mode by pushing “▶” key at “10. V-Com”
  - · As pushing the right or the left button on the remote controller, Find the V-COM value that is stopped the Flicker.
  - · If there is no flicker at default value, turn down or turn up at least 20 step and check the flicker. Then go to the default value.



(Visual Adjust and control the Voltage level)

- · Push the store button by “OK” key in the ADJ remocon.

4.6. Outgoing condition Configuration

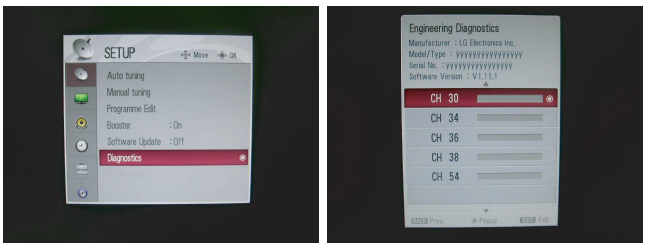
- When pressing IN-STOP key by SVC remocon, Red LED are blinked alternatively. And then Automatically turn off. (Must not AC power OFF during blinking)

4.7. Internal pressure

Confirm whether is normal or not when between power board's ac block and GND is impacted on 1.5 kV(dc) or 2.2 kV(dc) for one second

5. Serial number D/L

- press “Power on” key of service remocon. (Baud rate : 115200 bps)
- Connect RS232 Signal Cable to RS-232 Jack.
- Write Serial number by use RS-232.
- Must check the serial number at the Diagnostics of SET UP menu. (Refer to below).



5.1. Signal TABLE

CMD	LENGTH	ADH	ADL	DATA_1	. . .	Data_n	CS	DELAY

CMD : A0h
LENGTH : 85~94h (1~16 bytes)
ADH : EEPROM Sub Address high (00~1F)
ADL : EEPROM Sub Address low (00~FF)
Data : Write data
CS : CMD + LENGTH + ADH + ADL + Data_1 +…+ Data_n
Delay : 20ms

5.2. Command Set

No.	Adjust mode	CMD(hex)	LENGTH(hex)	Description
1	EEPROM WRITE	A0h	84h+n	n-bytes Write (n = 1~16)

* Description
FOS Default write : <7mode data> write
Vtotal, V_Frequency, Sync_Polarity, Htotal, Hstart, Vstart, 0, Phase
Data write : Model Name and Serial Number write in EEPROM,.

5.3. method & notice

A. Serial number D/L is using of scan equipment.
B. Setting of scan equipment operated by Manufacturing Technology Group.
C. Serial number D/L must be conformed when it is produced in production line, because serial number D/L is mandatory by D-book 4.0.

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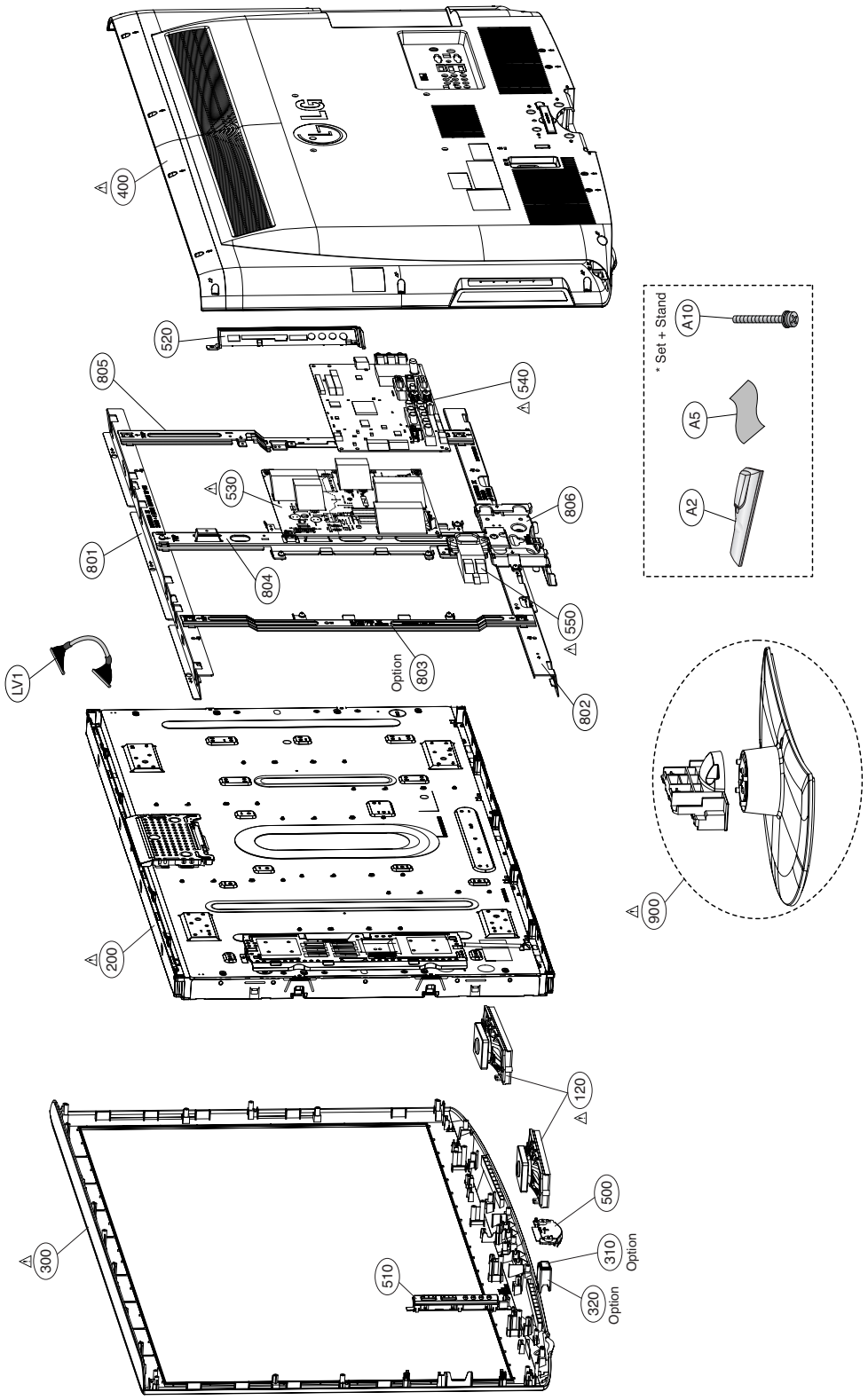
EXPLODED VIEW

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and EXPLODED VIEW.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.



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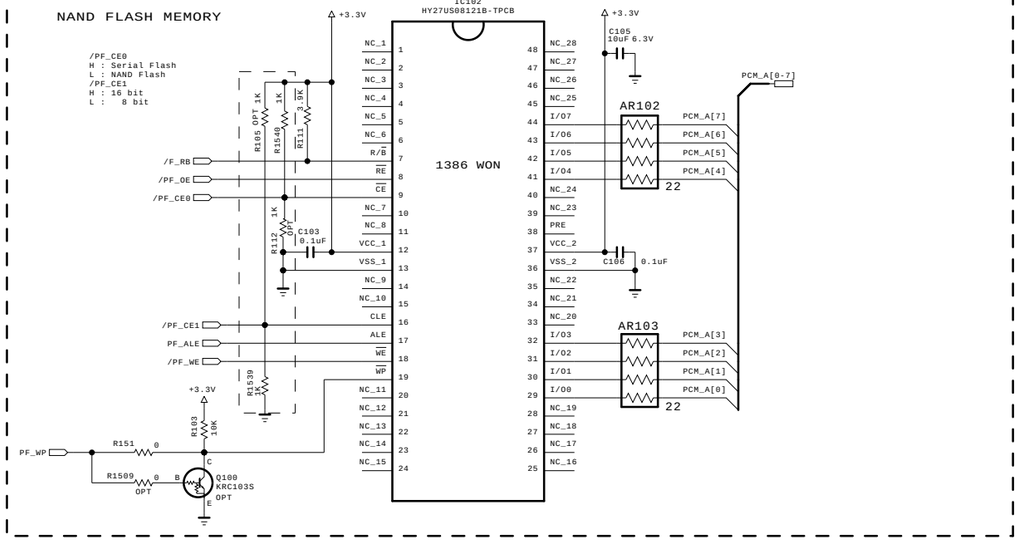
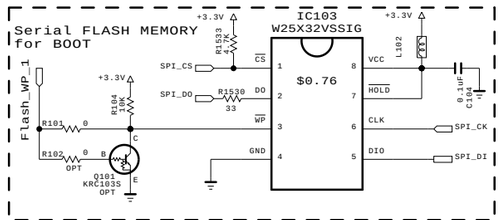
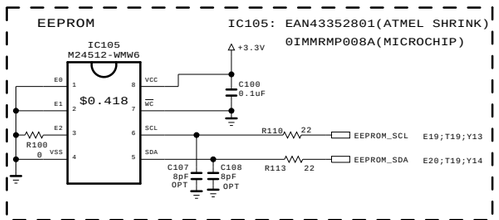
NAND FLASH MEMORY



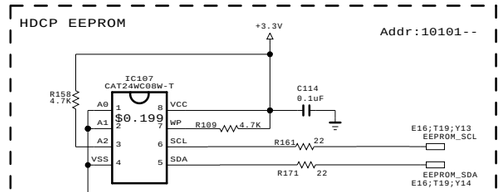
Serial FLASH MEMORY for BOOT



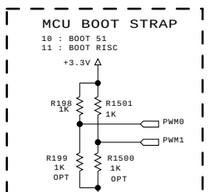
EEPROM



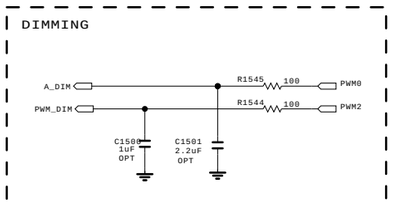
HDCP EEPROM



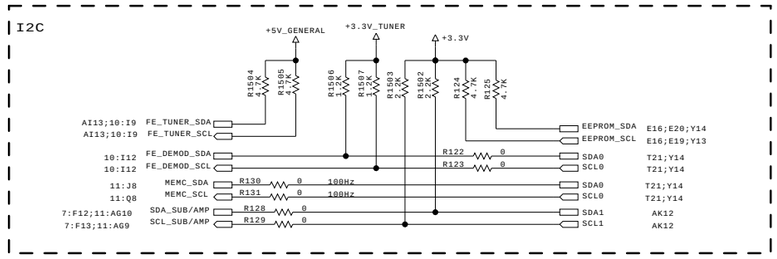
MCU BOOT STRAP



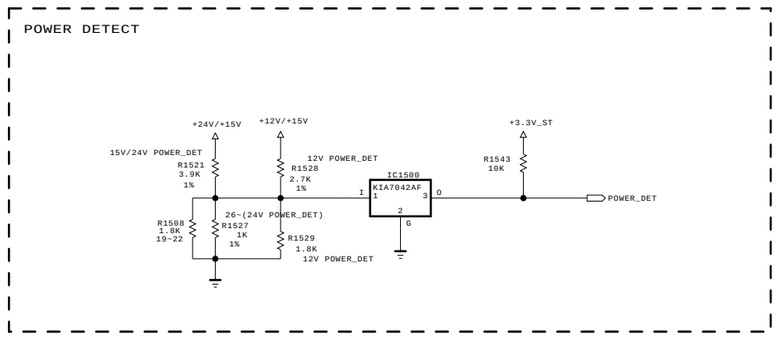
DIMMING



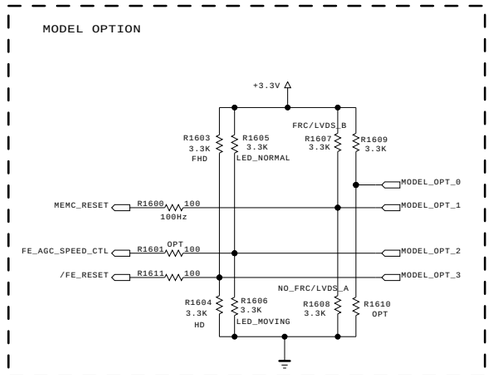
I2C



POWER DETECT



MODEL OPTION

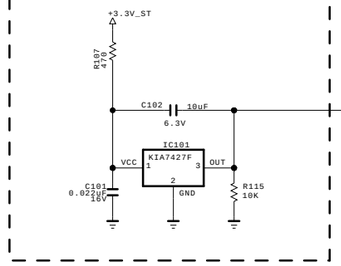


MODEL OPTION

PIN NAME	PIN NO.	HIGH	LOW
MODEL_OPT_0	D6	LCD	PDP
MODEL_OPT_1	D7	B9(FHD)	FRC	NO_FRC
		B9(HD)	LVDS_B	LVDS_A
MODEL_OPT_2	E11	LED_NORMAL	LED_MOVING
MODEL_OPT_3	B9	FHD	HD

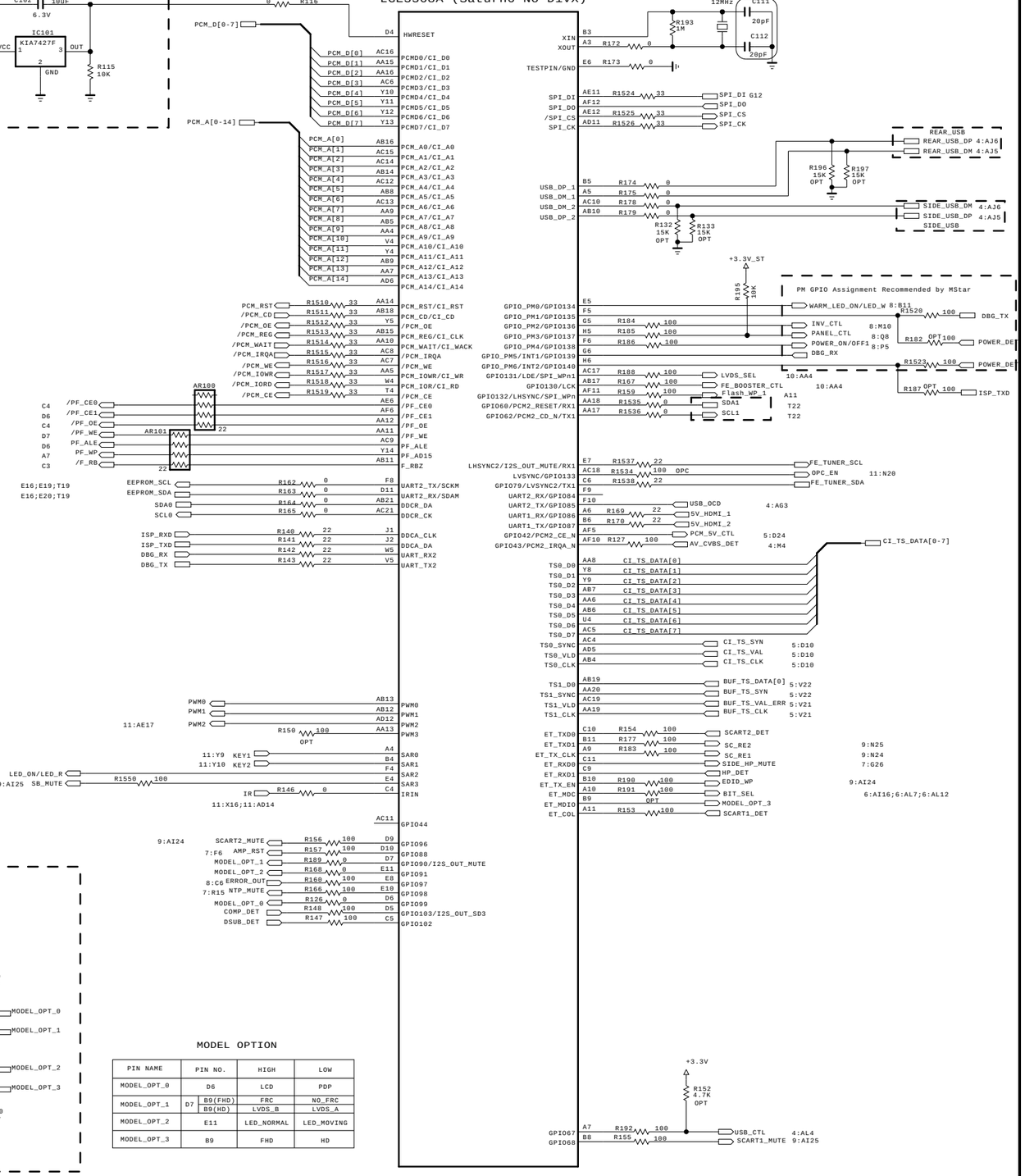
VOLTAGE DETECTOR

*Mstar reset:Active high reset



IC100

LGE3368A (Saturn6 No-DivX)



THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET

LGElectronics

LG ELECTRONICS

MODEL	EAX60686904	DATE	2009.03.25
BLOCK	MAIN_1	SHEET	1 / 11

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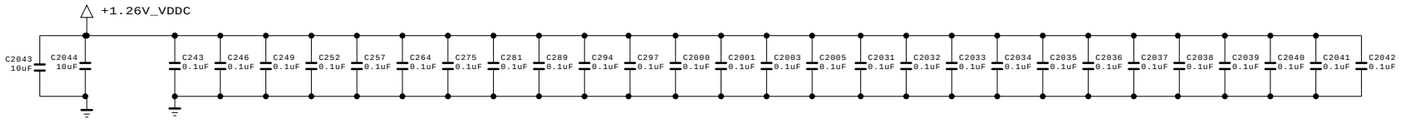

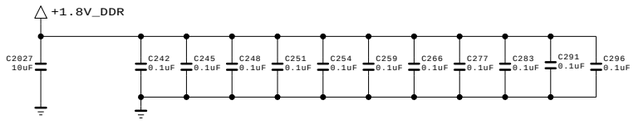

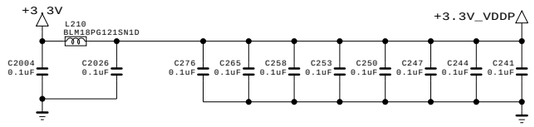

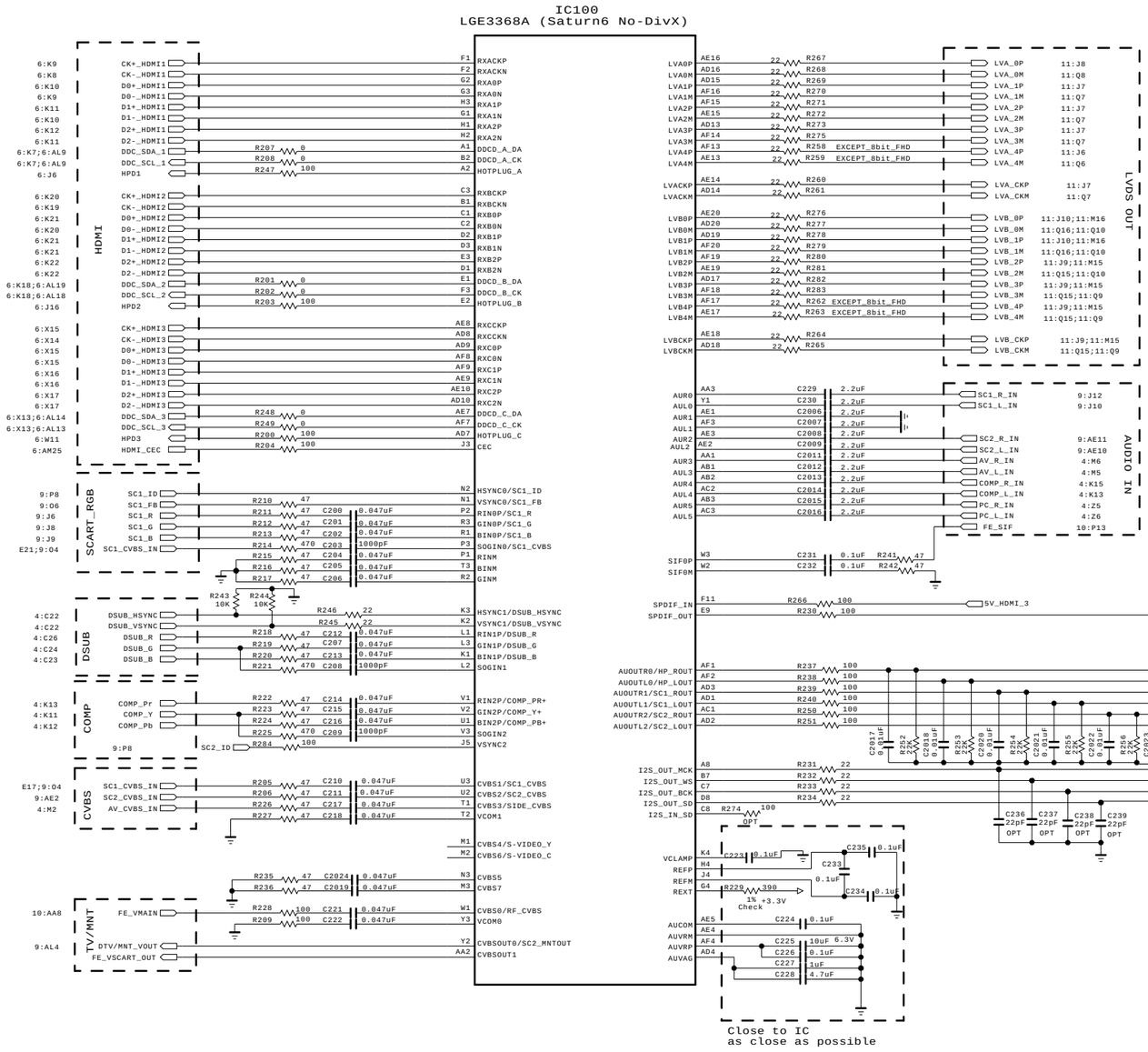

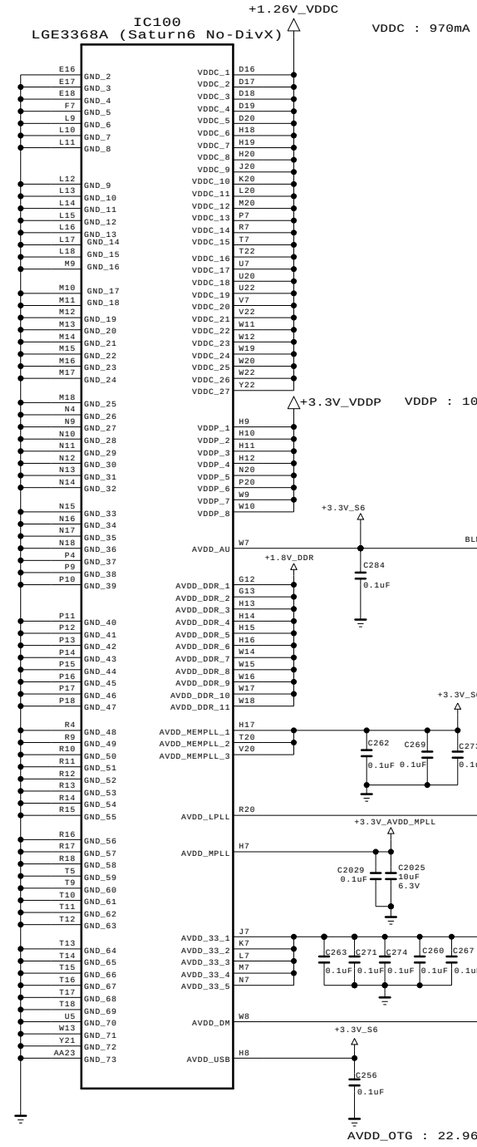

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SECRET

LGElectronics

LG ELECTRONICS

MODEL	EAX60686904	DATE	2009.03.25
BLOCK	MAIN_2	SHEET	2 / 11

MAIN_2

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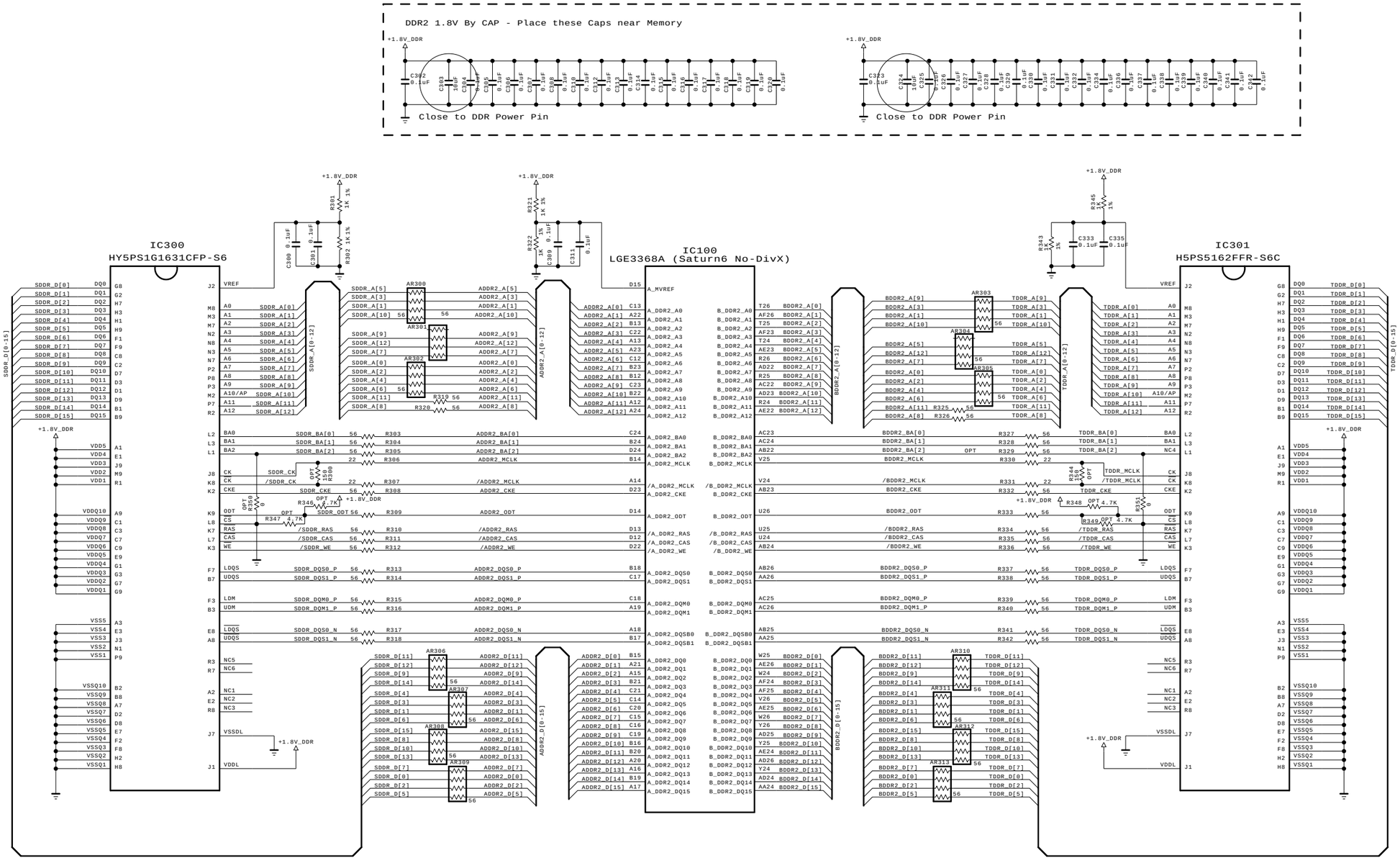

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SECRET

LGElectronics

LG ELECTRONICS

MODEL	EAX60686904	DATE	2009.03.25
BLOCK	DDR2	SHEET	3 / 11

DDR2

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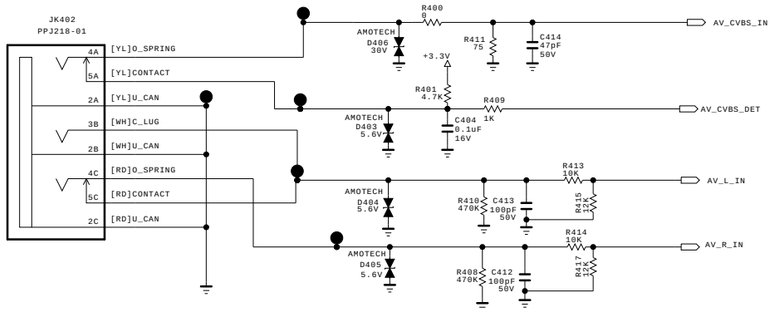
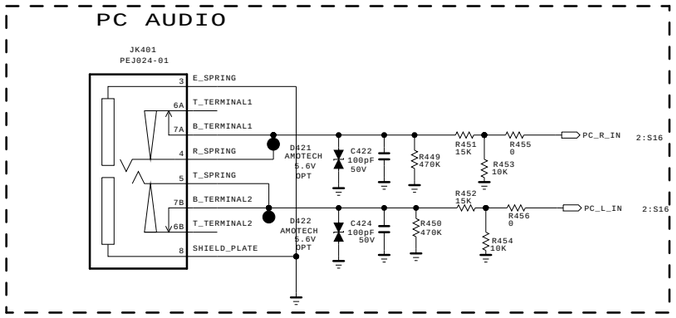
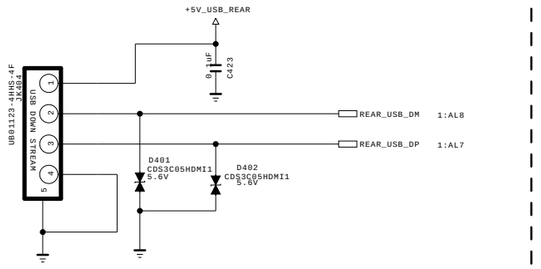
AV (OPT:SIDE_AV)



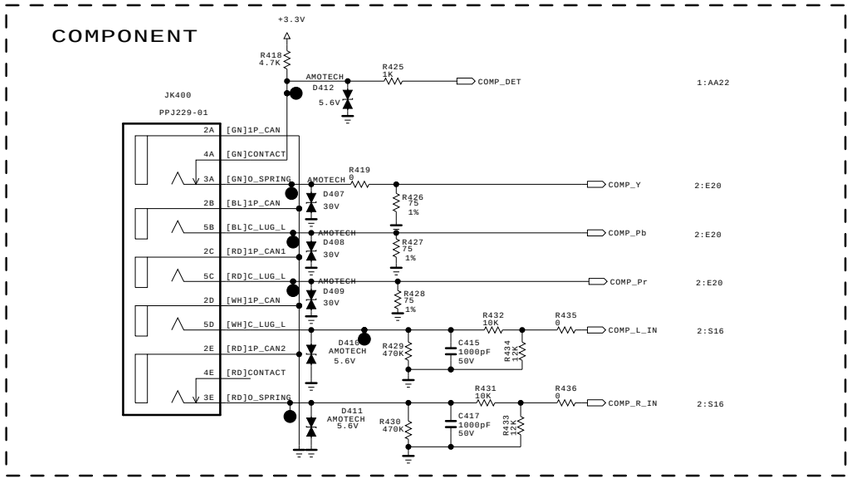
PC AUDIO



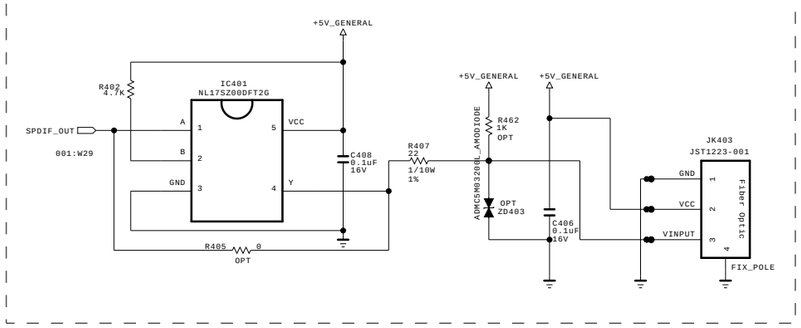
REAR USB (OPT:REAR_USB)



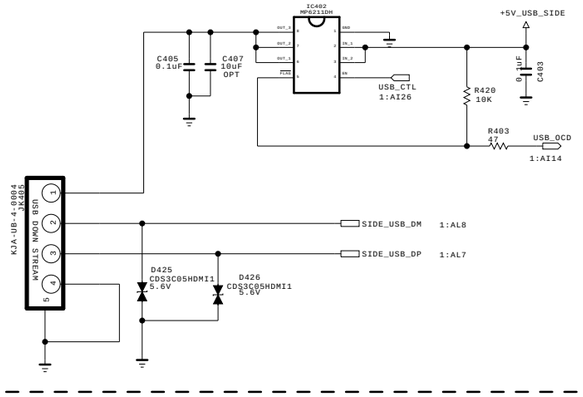
COMPONENT



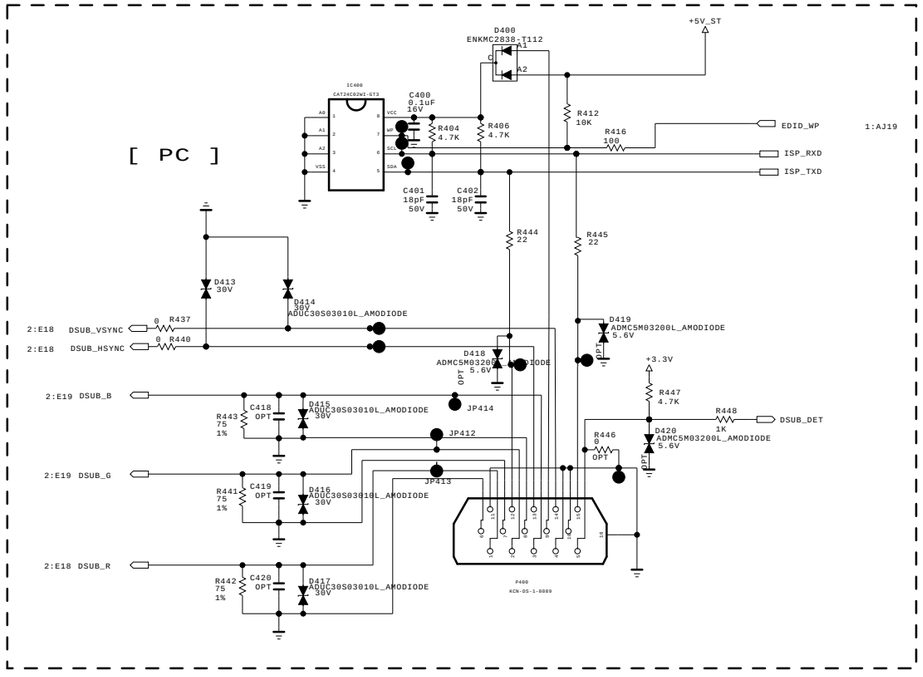
SPDIF OPTIC JACK



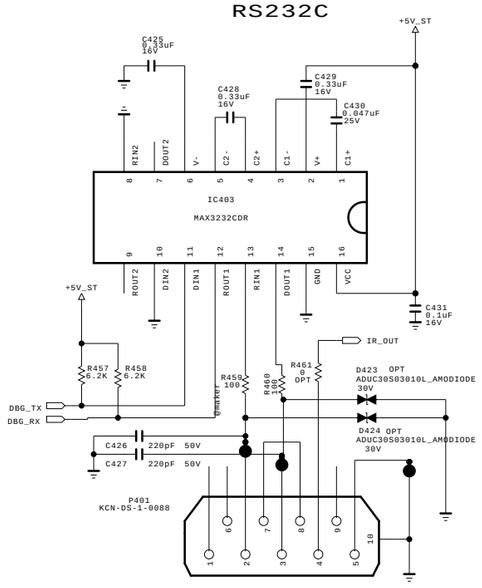
SIDE USB (OPT:SIDE_USB)



[PC]



RS232C



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MODEL	EAX60686904	DATE	2009.03.25
BLOCK	INTERFACE	SHEET	4 / 11

INTERFACE

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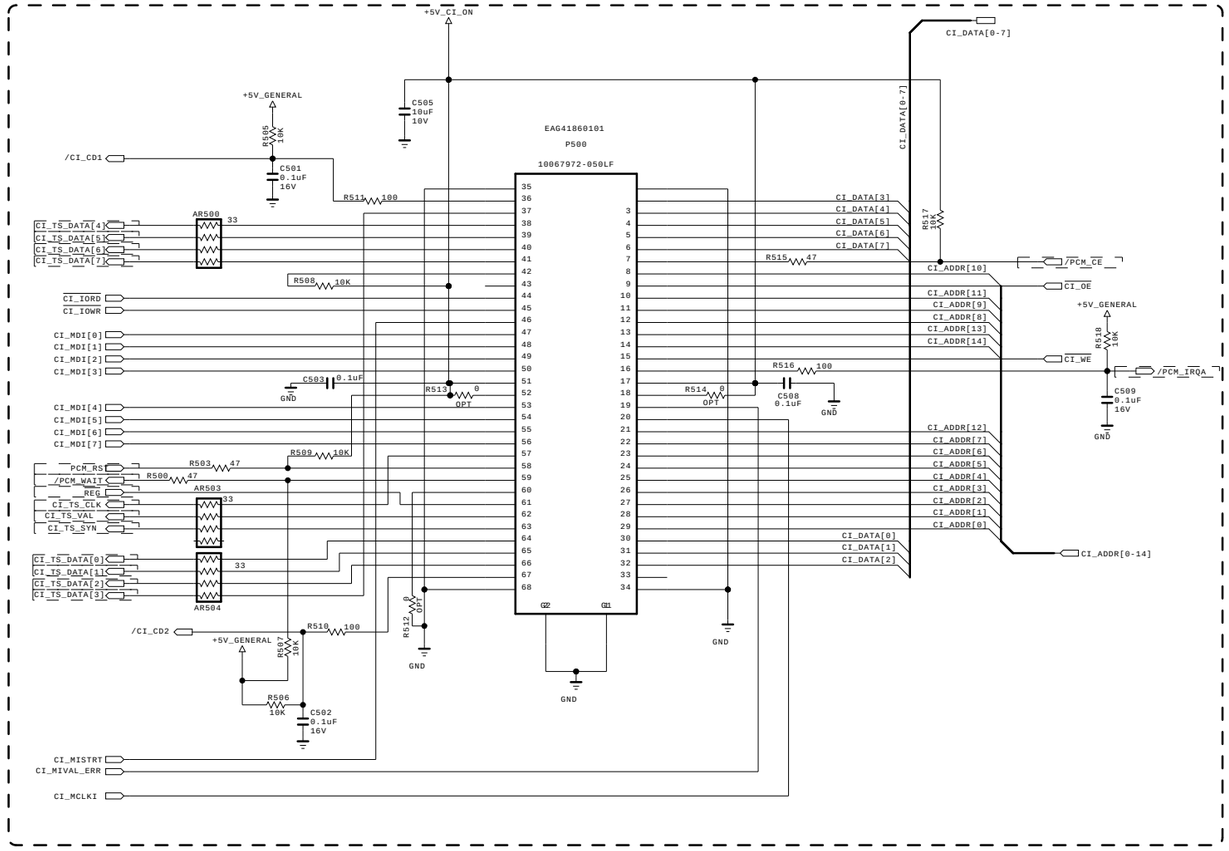
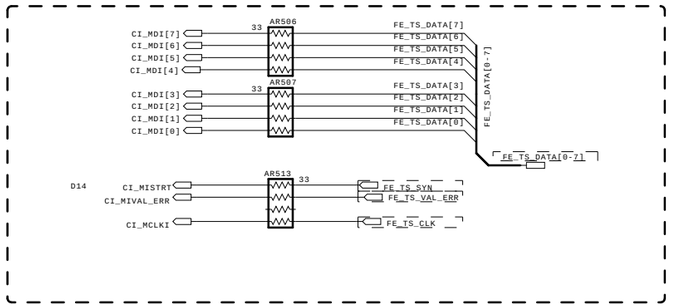
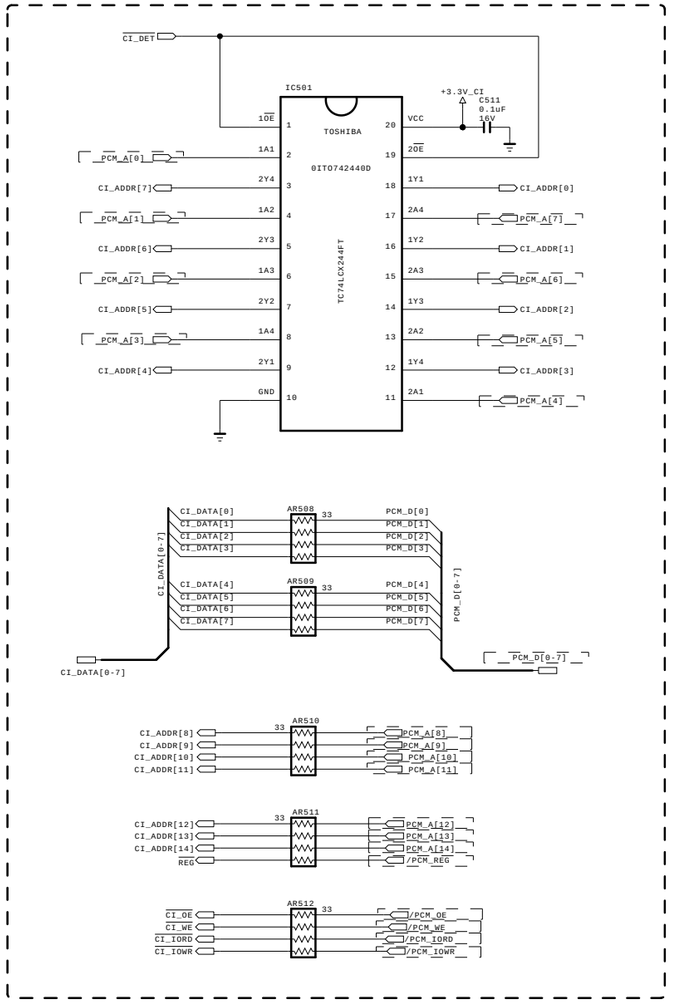
DVB-CI SLOT



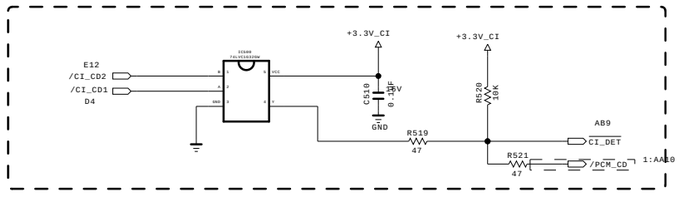
DVB-CI TS INPUT



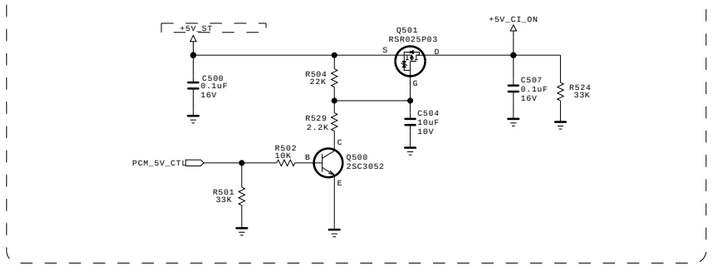
DVB-CI HOST I/F



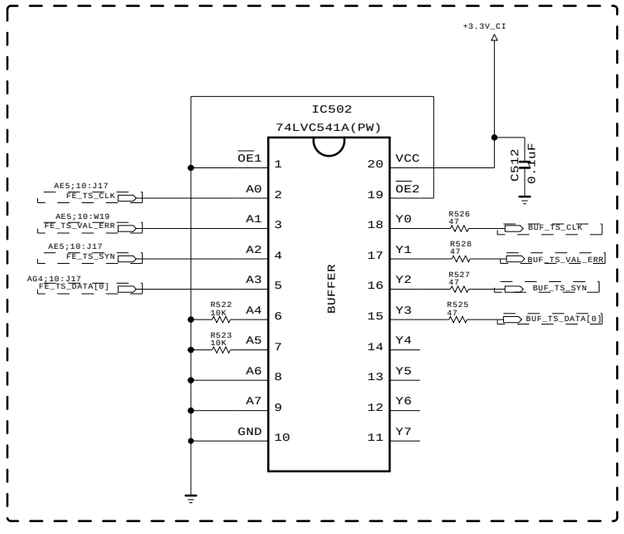
DVB-CI DETECT



CI POWER ENABLE CONTROL



DVB-CI SERIAL BUFFER TS



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PCMCIA

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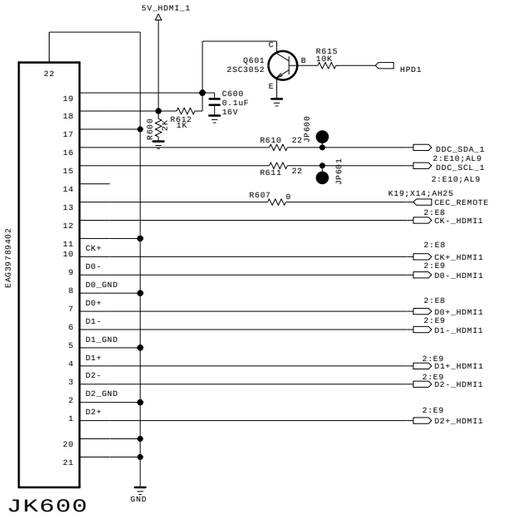
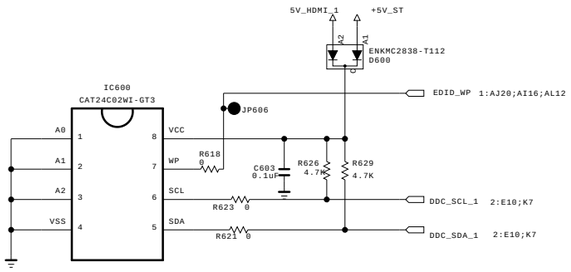
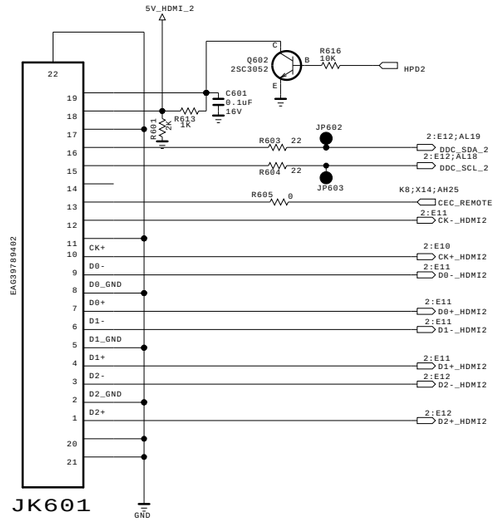
UI_HW_PORT1

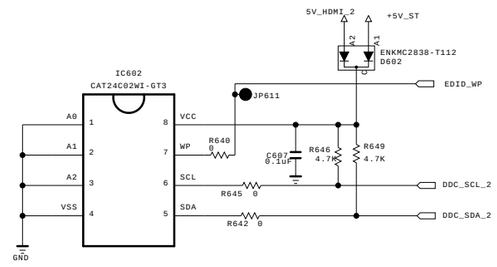




UI_HW_PORT2

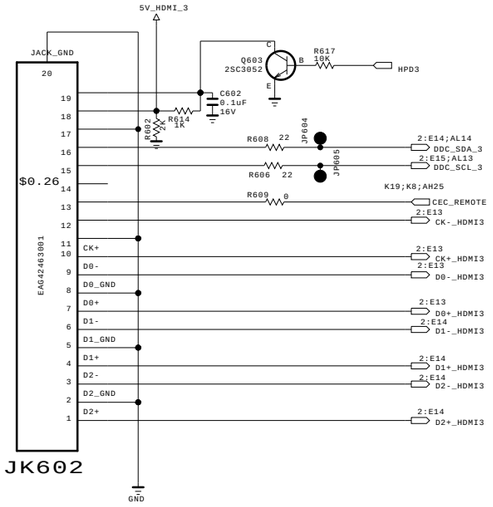
(OPT:REAR_HDMI_2EA)

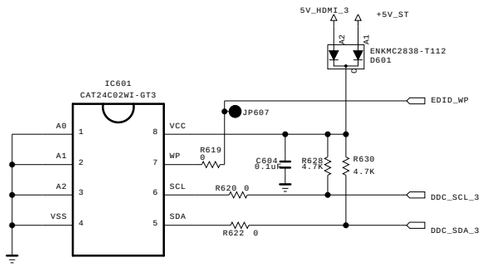




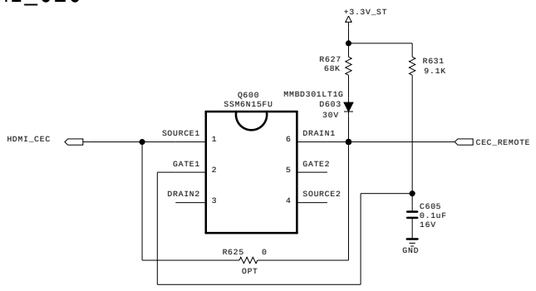
UI_HW_PORT3

SIDE HDMI (OPT:SIDE_HDMI)





HDMI_CEC



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BLOCK	HDMI	SHEET	6 / 11

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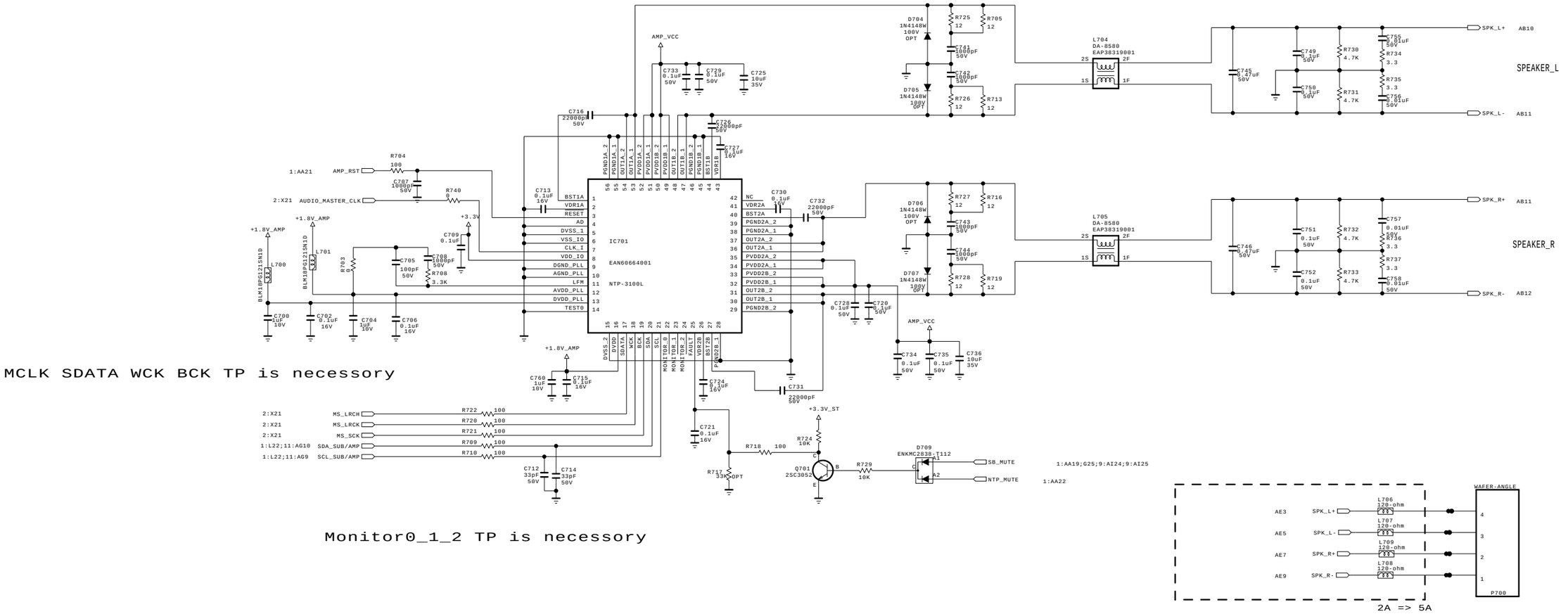

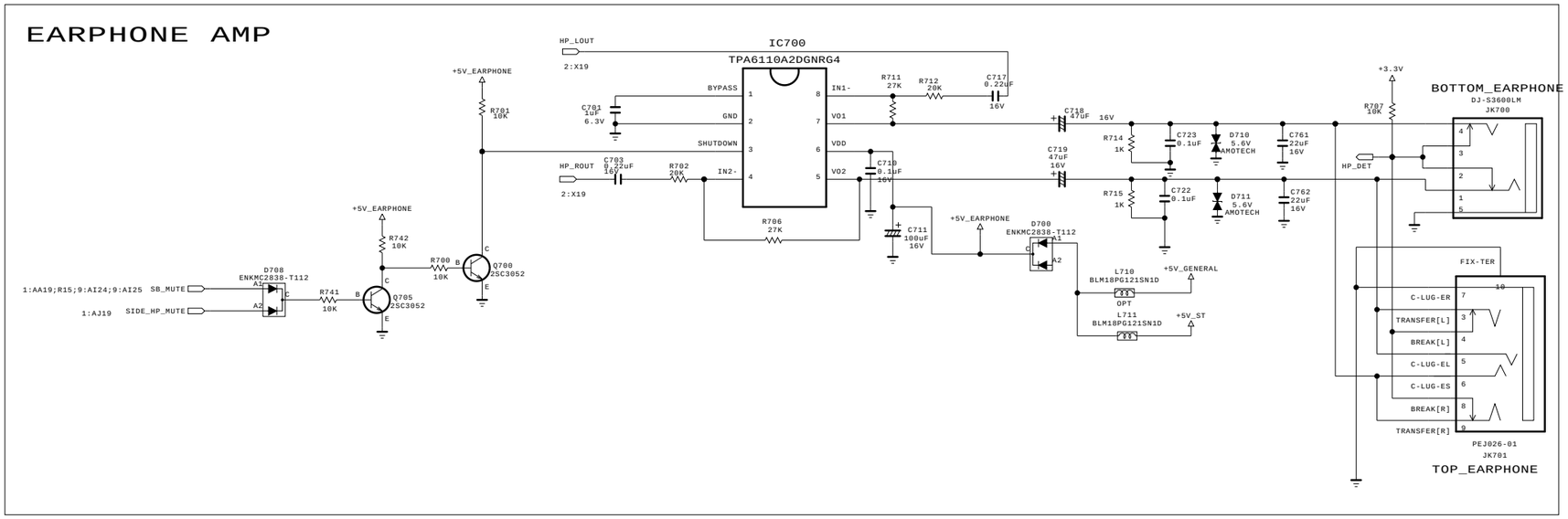

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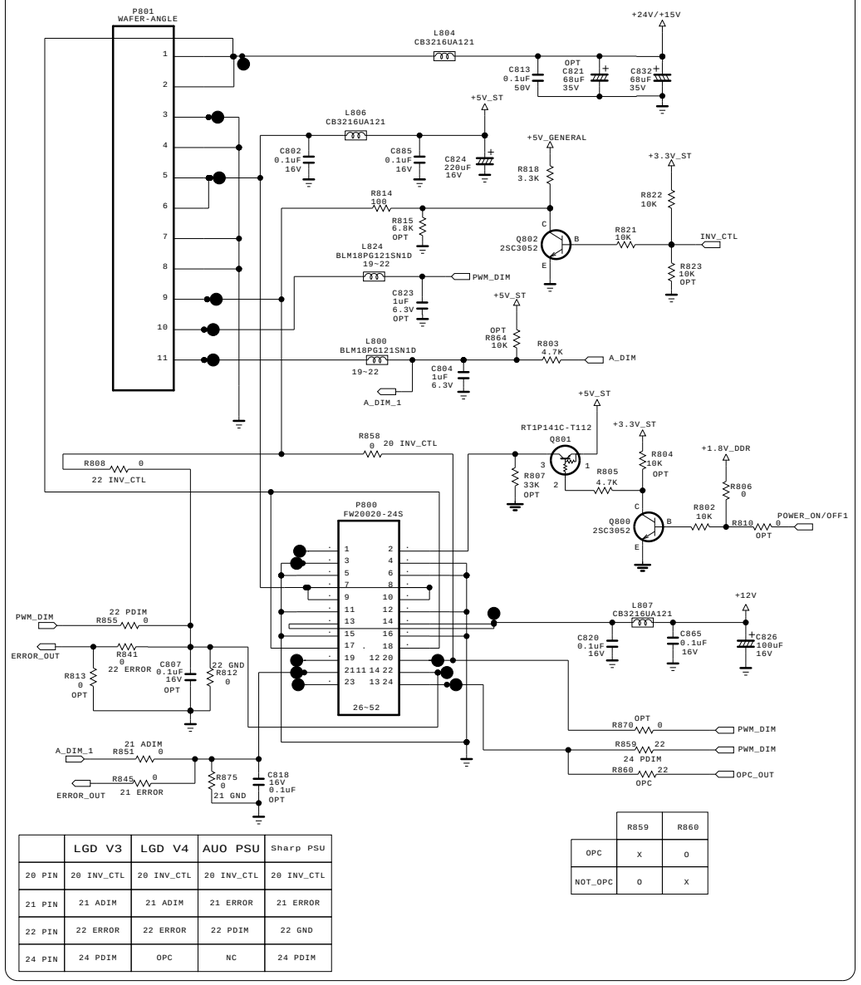
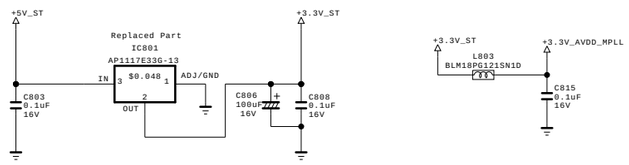
19~22

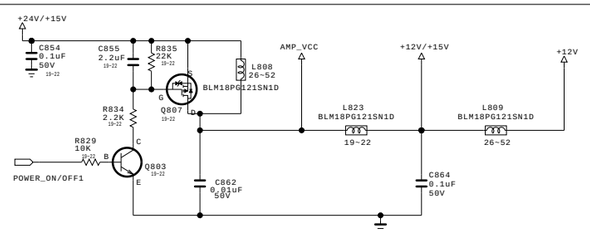


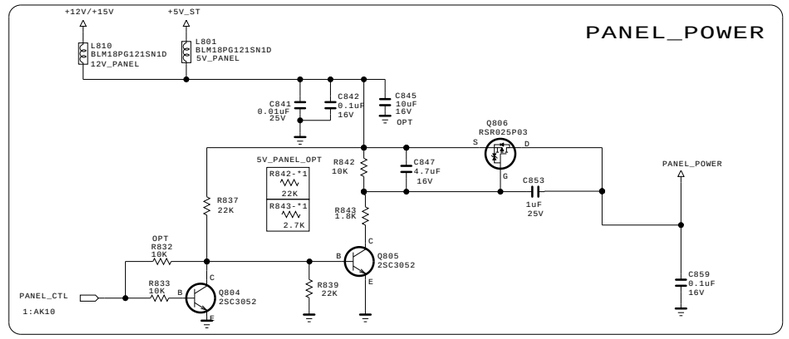
	LGD V3	LGD V4	AUO PSU	Sharp PSU
20 PIN	20 INV_CTL	20 INV_CTL	20 INV_CTL	20 INV_CTL
21 PIN	21 ADIM	21 ADIM	21 ERROR	21 ERROR
22 PIN	22 ERROR	22 ERROR	22 PDIM	22 GND
24 PIN	24 PDIM	OPC	NC	24 PDIM

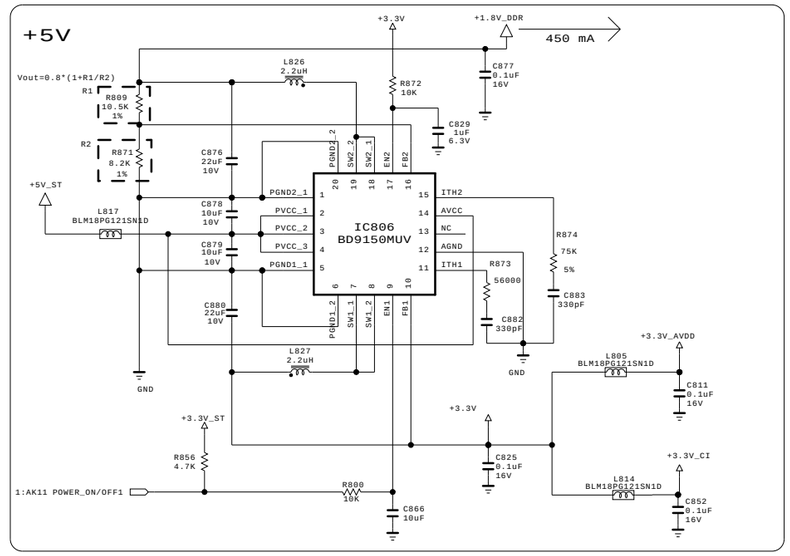
	R859	R860
OPC	X	O
NOT_OPC	O	X

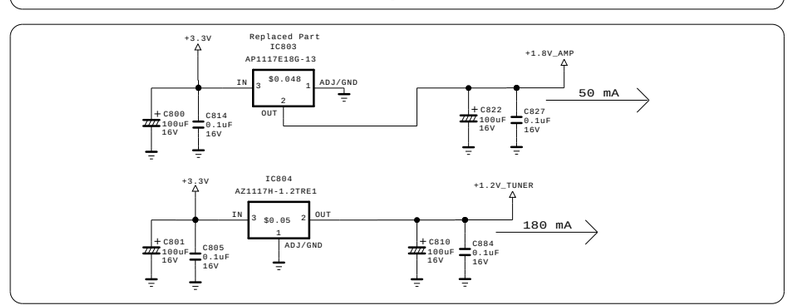
Stand-by +3.3V



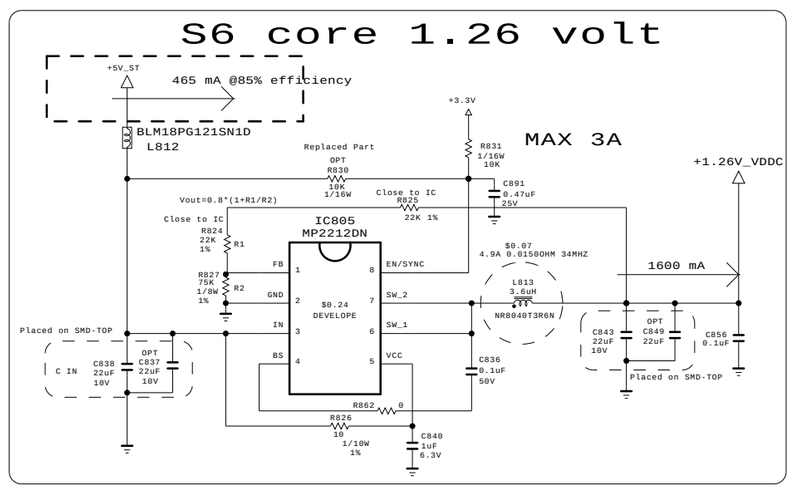




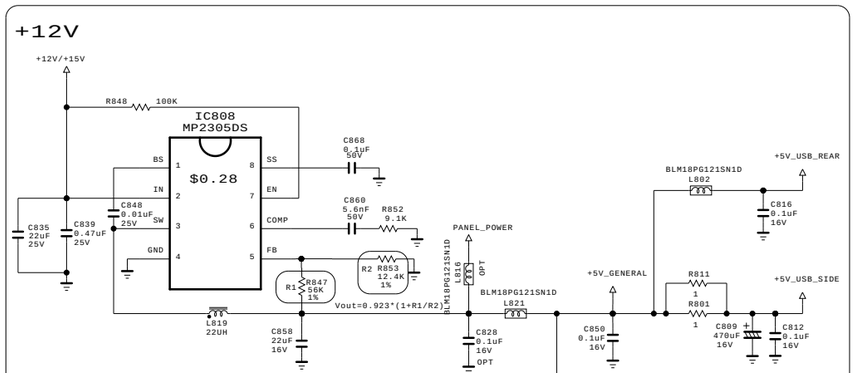




S6 core 1.26 volt



+12V



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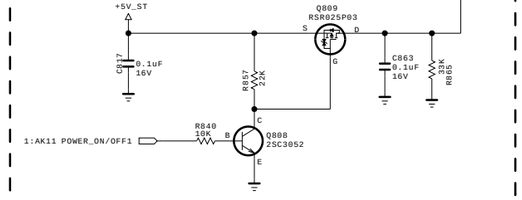

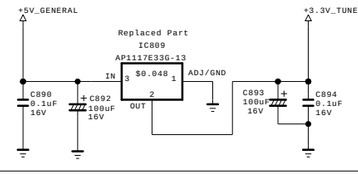

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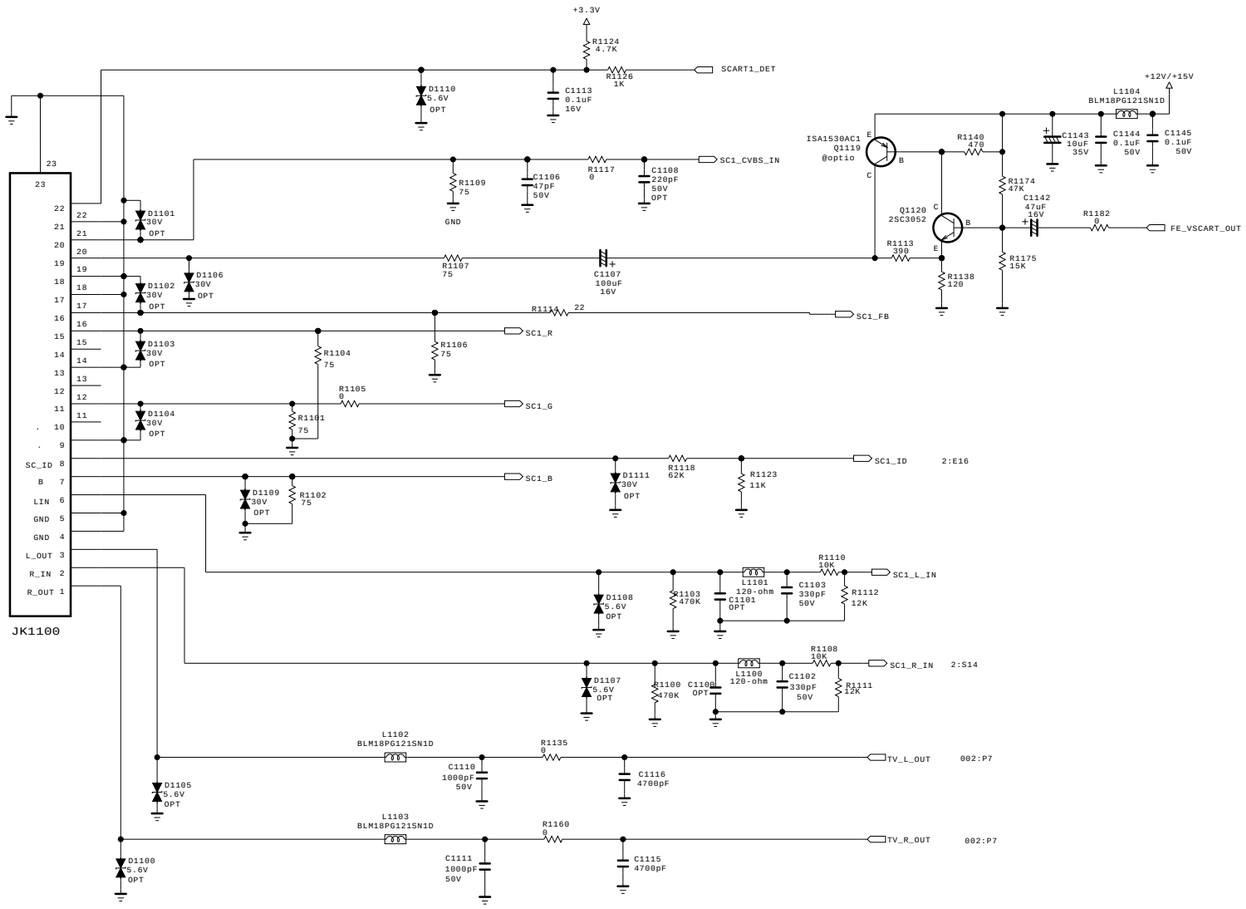
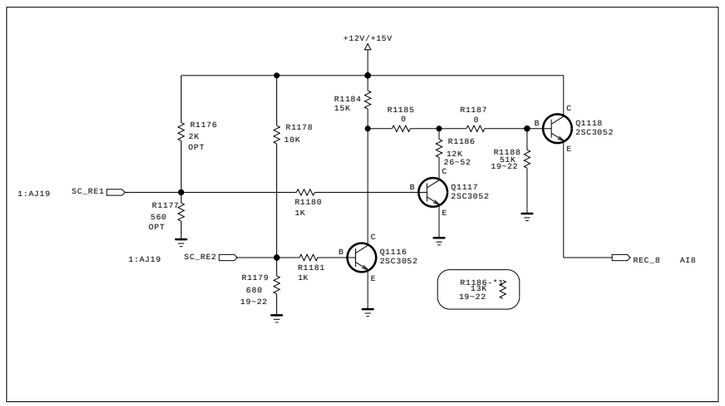
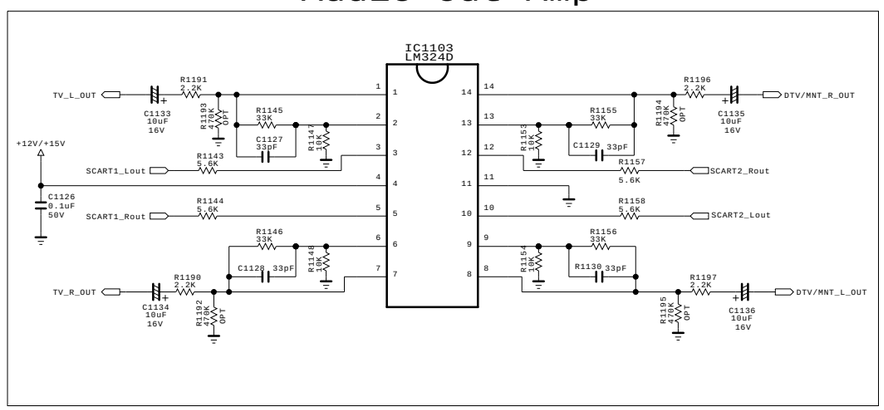


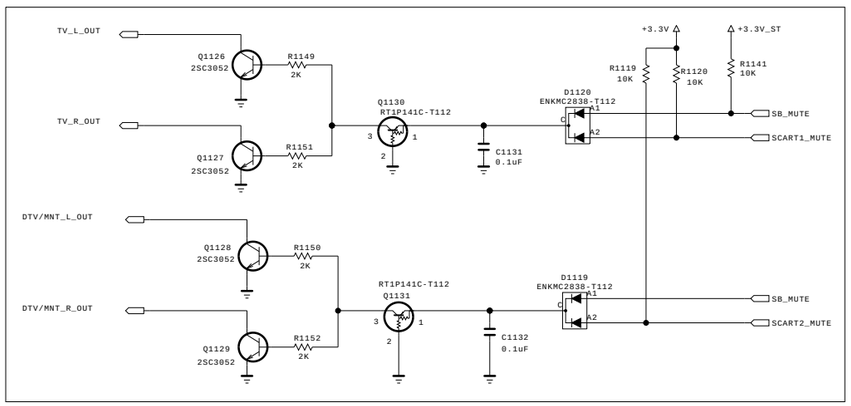
SCART2 PIN 8



Audio Out Amp



Scart Audio Mute



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SCART

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Digital Tuner : 0x1E
Analog Tuner : 0x86
Tuner PLL : 0xC2

TU1200
TDFW-G235D

DVB-T : 1.8V(INTEL demod)
DVB-T/C : 1.2V(MICRONAS demod)

TUNER

ANT[5V] 1 — C1200 0.1uF 16V
BB[CTR] 2 — L1201 MLB-201209-0120P-N2 — +5V_GENERAL
GND_1 3
+B[5V] 4 — C1207 100pF 50V; C1208 0.1uF 16V OPT; C1209 68uF 10V
NC_1 5
RF_AGC 6 — C1210 0.1uF 16V; C1212 47uF 16V; Q1200 2SC3052; R1209 10K; FE_AGC_SPEED_CTL
TP[VT] 7
NC_2 8
GND_2 9 — C1205 47pF 50V OPT; C1206 47pF 50V OPT
SDA_T 10 — R1207 47 — FE_TUNER_SDA
SCL_T 11 — R1208 47 — FE_TUNER_SCL
AIF_1 12
NC_3 13
GND 14
VIDEO 15 — R1205 0 — R1238 0; R1239 1K OPT; Q1205 ISA1530AC1; R1240 200; R1241 200; +5V_GENERAL; FE_VMAIN
NC_4 16
SIF 17 — C1216 100pF 50V
SDA 18 — R1221 33 — FE_DEMOD_SDA
SCL 19 — R1222 33 — FE_DEMOD_SCL
RST 20 — C1217 47pF 50V; C1218 47pF 50V
3.3V 21 — C1214 0.1uF 16V
1.2V 22 — C1215 0.1uF 16V
ERR 23
MCL 24 — R1210 47 — FE_TS_CLK
D7 25 — R1211 47 — FE_TS_DATA[7]
D6 26 — R1212 47 — FE_TS_DATA[6]
D5 27 — R1213 47 — FE_TS_DATA[5]
D4 28 — R1214 47 — FE_TS_DATA[4]
D3 29 — R1215 47 — FE_TS_DATA[3]
D2 30 — R1216 47 — FE_TS_DATA[2]
D1 31 — R1217 47 — FE_TS_DATA[1]
D0 32 — R1218 47 — FE_TS_DATA[0]
VAL 33 — R1219 47 — FE_TS_VAL
SYNC 34 — R1220 47 — FE_TS_SYN
35 — SHIELD

+3.3V_TUNER — R1224 100; R1225 100K; C1219 0.1uF 16V; /FE_RESET
+5V_GENERAL — R1227 470; R1228 82 — FE_SIF; R1226 4.7K; Q1201 ISA1530AC1

FE_TS_DATA[0-7],FE_TS_CLK,FE_TS_VAL,FE_TS_SYN

L1202 MLB-201209-0120P-N2 — +3.3V_TUNER
C1221 0.1uF 16V

+1.2V_TUNER
C1220 0.1uF 16V

R1223 0 — FE_TS_ERR

+5V_GENERAL — L1204 MLB-201209-0120P-N2
R1229 10
R1231 10K
Q1202 ISA1530AC1
R1230 2.2K
Q1203 2SC3052
R1232 10K — FE_BOOSTER_CTL
C1222 0.01uF 25V

OPTION : RF AGC

DVB-CI DETECT

+3.3V_TUNER
FE_TS_VAL
FE_TS_ERR
IC1201 NL17SZ00DFT2G
C1227 0.1uF 16V
GND
R1245 47 — FE_TS_VAL_ERR

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TUNER

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Module

	R1378	R1379
HD	X	0
FHD	X	0

+3.3V
R1378 3.3K
LVDS_SEL_PULLUP
R1367 OPT 22
LVDS_SEL
R1379 0
LVDS_SEL_GND

LVDS_HD_26~42
P1302
FF10001-30

External VBR
PWM_DIM
OPC_OUT
OPC_OUTPUT
1:V17;8:M8
V4 OPTION
R1366 22
R1365 22

MEMC_SDA 1:L21
MEMC_SCL 1:L21
MEMC_RESET

+3.3V
R1372 510 OPC
OPC_EABLE
OPC_EN
R1373 0 OPT

	R1370	R1371
10BIT	X	X
8BIT	X	0

+3.3V
R1370 3.3K OPT
BIT_SEL
R1371 0 BIT_SEL_GND(8bit)

LVB_0M
LVB_0P
LVB_1M
LVB_1P
LVB_2M
LVB_2P
LVB_CKM
LVB_CKP
LVB_3M
LVB_3P
LVA_4P
LVA_0M
LVA_0P
LVA_1M
LVA_1P
LVA_2M
LVA_2P
LVA_CKM
LVA_CKP
LVA_3M
LVA_3P
LVA_4M
LVA_4P

EXCEPT_22LU50
R1612 0
R1613 0
EXCEPT_22LU50

TF05-51S
P1301

D_LVDS_WAFER

LVDS_HD_19~22
FF10001-30
P1300

LVDS_MNT_HD_19~22
FF10001-30
P1306

Small

PANEL_POWER
L1300 BLM18PG121SN1D
R1315 OPT
R1314 OPT
R1313 OPT
R1312 OPT
C1303 220uF 16V OPT
C1301 1000pF 50V
C1300 0.1uF 16V

CONTROL
IR & LED

19~22/26LH2000

P1303
12507WR-03L

+3.3V_ST
R1319 4.7K
R1320 4.7K
19~22/26LH2000
L1304 BLM18PG121SN1D
L1302 BLM18PG121SN1D
KEY1
KEY2
R1318 100
R1317 100
C1306 0.1uF 16V
C1308 0.1uF 16V
ZD1301 5.6V AMOTECH
ZD1300 5.6V AMOTECH
GND
L1301 BLM18PG121SN1D
L1303 BLM18PG121SN1D
C1305 0.1uF
C1307 0.1uF

12PIN IR

P1304
12507WS-12L

SCL_SUB/AMP
SDA_SUB/AMP
R1321 100
R1322 100
D1300 CDS3C05HDMI1 5.6V
D1301 CDS3C05HDMI1 5.6V
ZD1304 5.6V AMOTECH
ZD1302 5.6V AMOTECH
R1325 4.7K
C1302 0.1uF 16V
R1323 100
R1306 10K
SCL
SDA
GND
KEY1
KEY2
5V_ST
GND
WARM_ST
IR
GND
3.3V
PWR_ON

8PIN IR

P1305
12507WS-08L

+5V_ST
L1307 BLM18PG121SN1D
C1314 0.1uF 16V
C1315 1000pF 50V
L1305 BLM18PG121SN1D
L1306 BLM18PG121SN1D
C1313 1000pF 50V
C1312 1000pF 50V
ZD1306 5.6V AMOTECH
ZD1305 5.6V AMOTECH
WARM_LED_ON/LED_W
LED_ON/LED_R
IR
R1305 100
C1309 100pF 50V
ZD1303 5.6V AMOTECH
L1308 BLM18PG121SN1D
C1310 0.1uF 16V
C1311 1000pF 50V

IR_OUT
R1300 0 OPT
R1301 47K OPT
R1302 10K OPT
R1303 47K OPT
R1304 47K OPT
Q1300 2SC3052 OPT
Q1301 2SC3052 OPT

Zener Diode is close to wafer

THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	EAX60686904	DATE	2009.03.25
BLOCK	MODULE&CTL	SHEET	11 / 11

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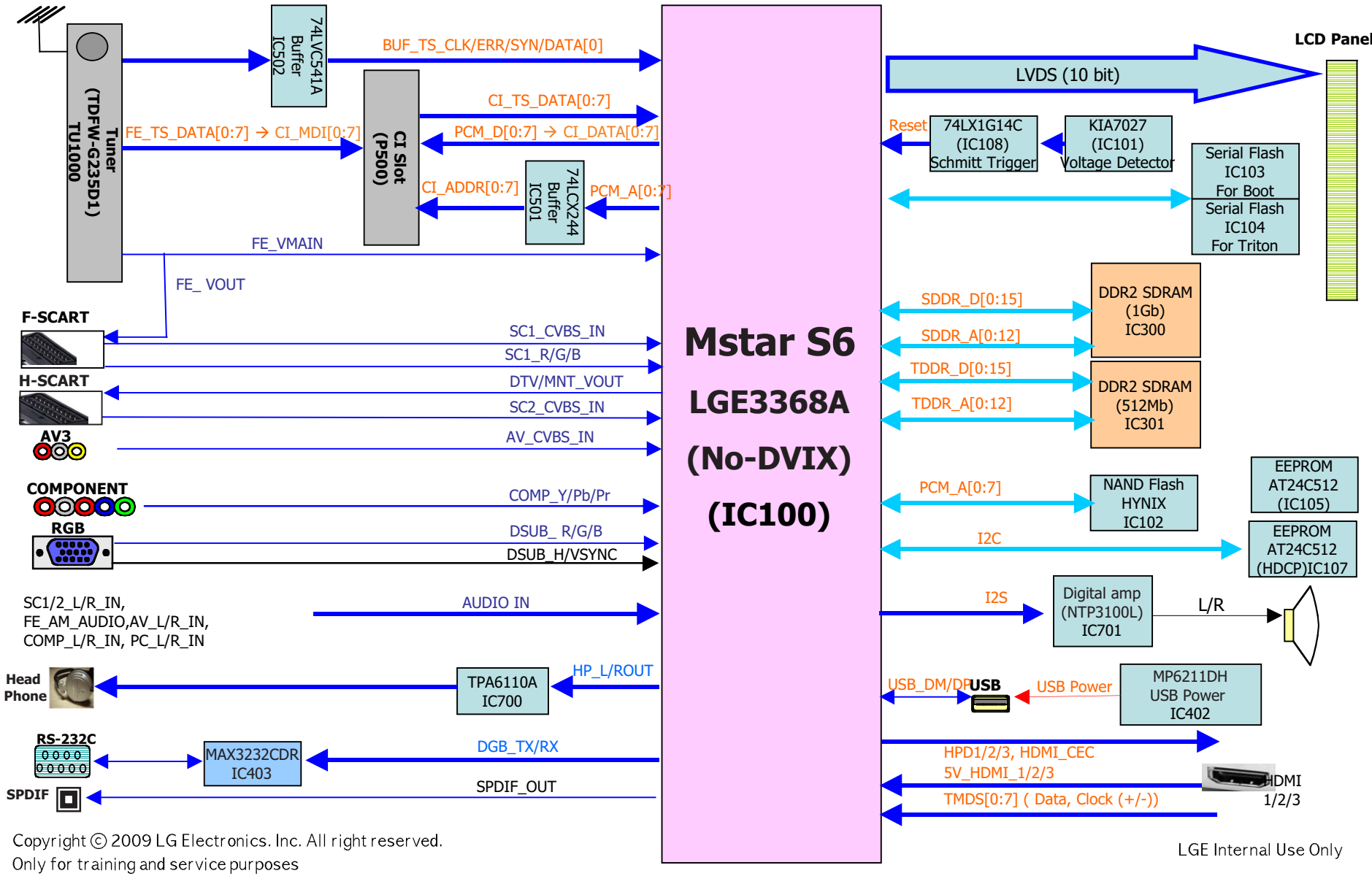
Block diagram

- 19/22/26/32/37/42LH2000
- 32/37/42/47LH3000
- 32/37/42/47LH4000

Block Diagram



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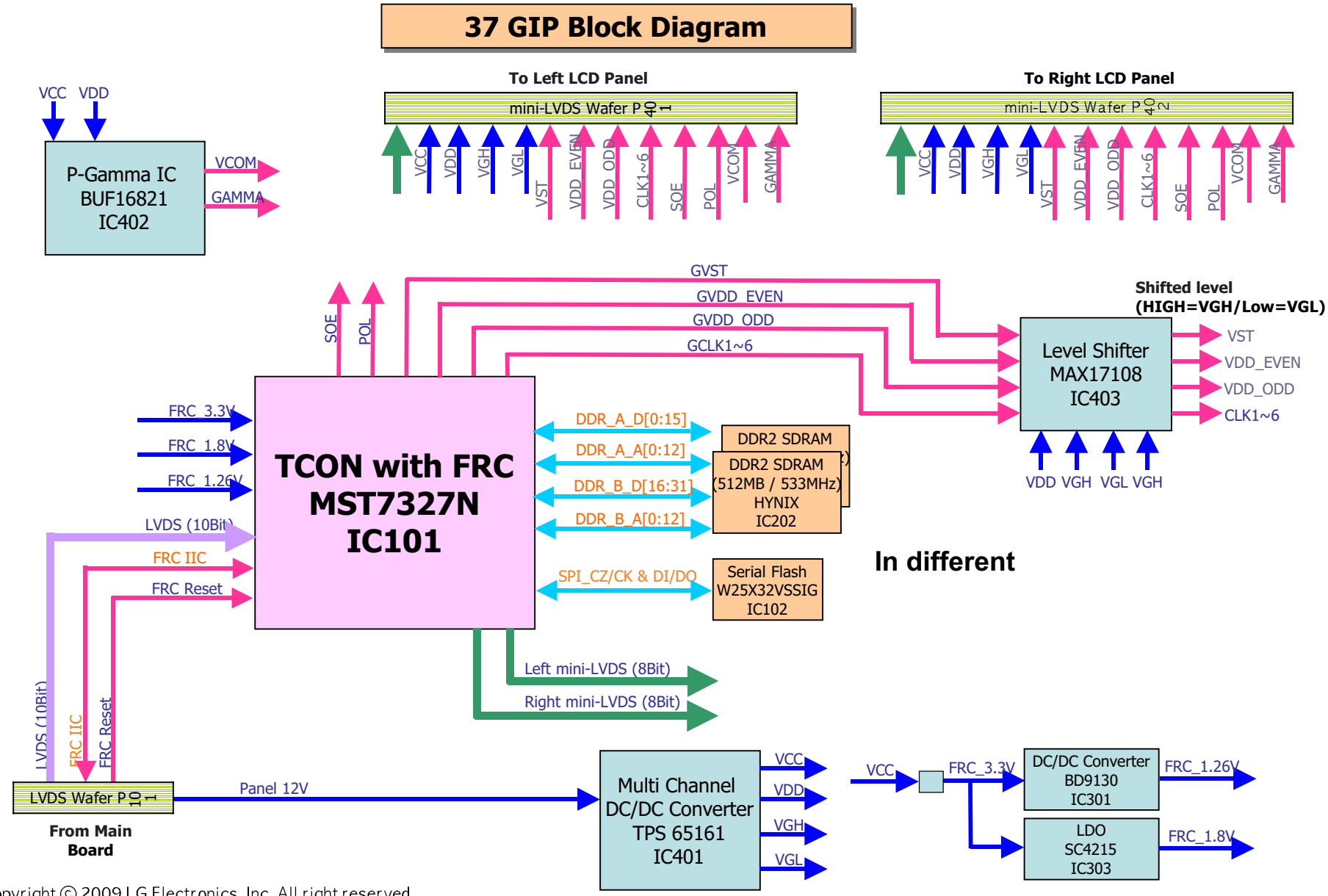
Block diagram

M+S T-Con Block

Only for 37LH4000

*M+S : Main B/D + T-con B/D



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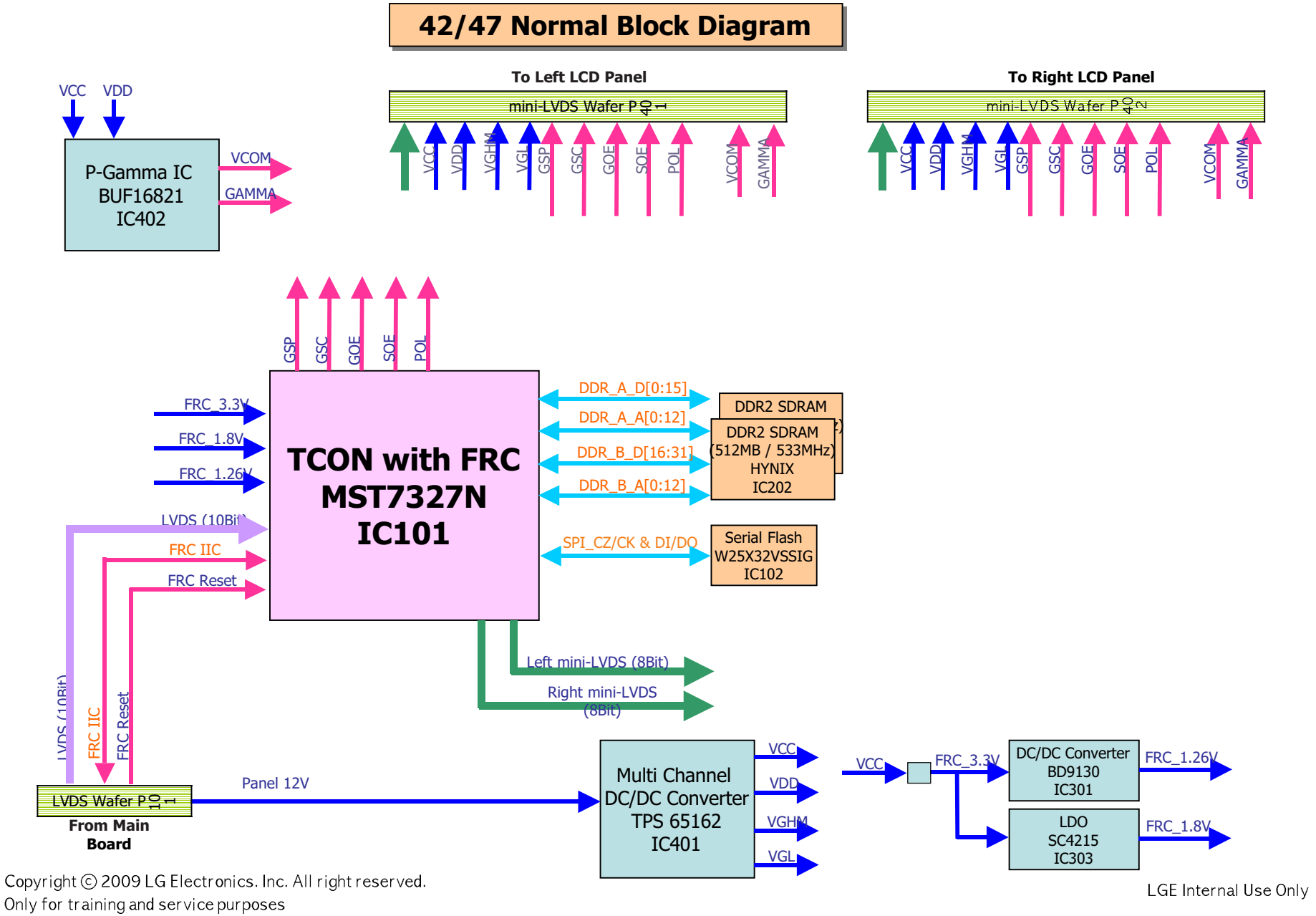
Block diagram

M+S T-Con Block

Only for 42/47LH4000

***M+S : Main B/D + T-con B/D**



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Contents of LCD TV Standard Repair Process

No.	Error symptom (High category)	Error symptom (Mid category)	Page	Remarks
1	A. Video error	No video/Normal audio	1	
2		No video/No audio	2	
3		Video error, video lag/stop	3	
4		Color error	4	
5		Vertical/Horizontal bar, residual image, light spot, external device color error	5	
6	B. Power error	No power	6	
7		Off when on, off while viewing, power auto on/off	7	
8	C. Audio error	No audio/Normal video	8	
9		Wrecked audio/discontinuation/noise	9	
10	D. Function error	No response in remote controller, key error, recording error, memory error	10	
11		External device recognition error	11	
12	E. Noise	Circuit noise, mechanical noise	12	
13	F. Exterior error	Exterior defect	13	

First of all, Check whether there is SVC Bulletin in GCSC System for these model.

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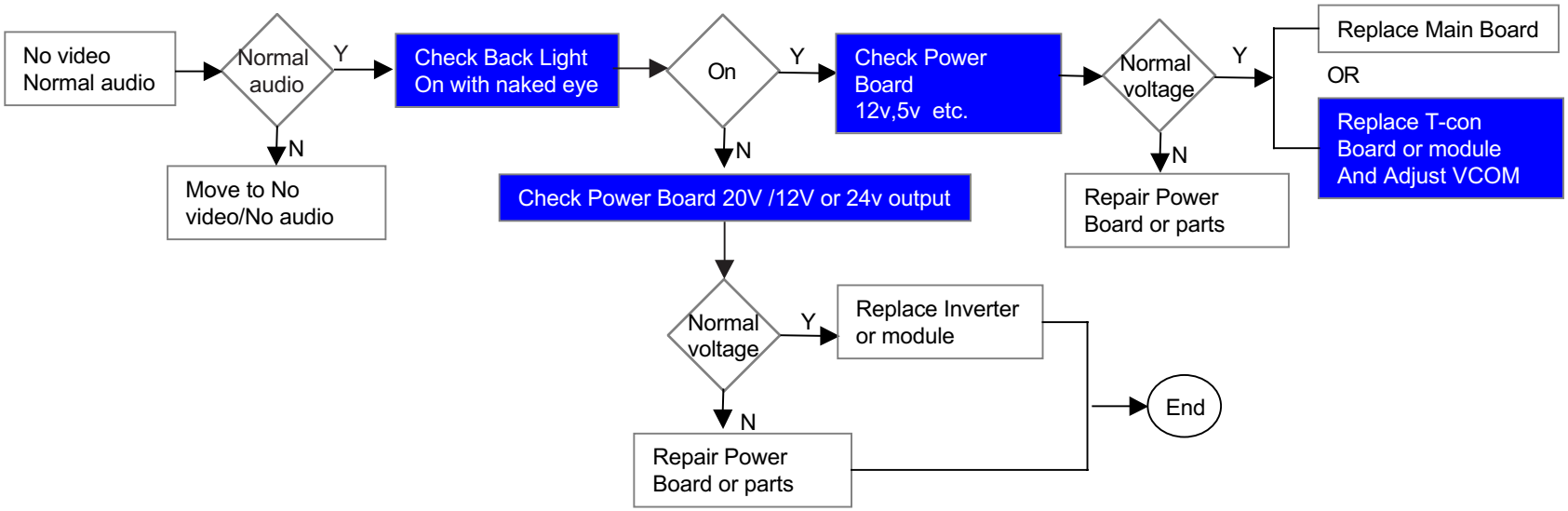
Standard Repair Process

LCD TV	Error symptom	A. Video error	Established date	2008. 3 .05	
		No video/ Normal audio	Revised date		1/13

First of all, Check whether all of cables between board is inserted properly or not.

(Main B/D↔ Power B/D, LVDS Cable,Speaker Cable,IR B/D Cable,,,)



※ Precaution

Always check & record S/W Version and White Balance value before replacing the Main Board → Replace Main Board → Re-enter White Balance value

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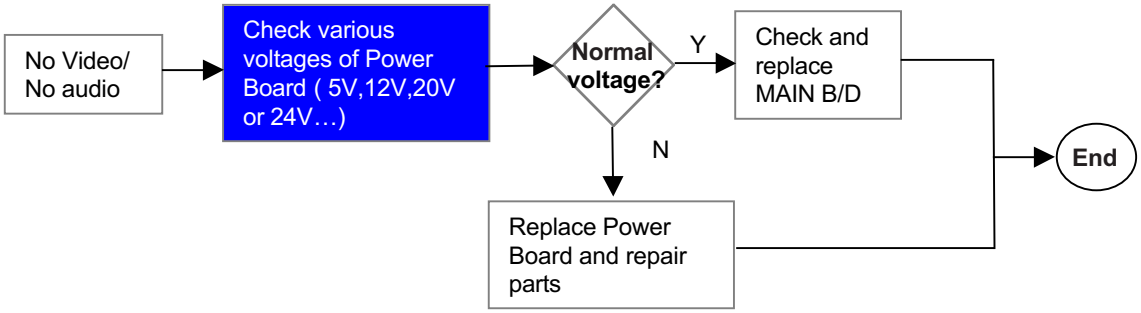
LCD TV	Error symptom	A. Video error	Established date	2008. 3 .05	
		No video/ No audio	Revised date		2/13



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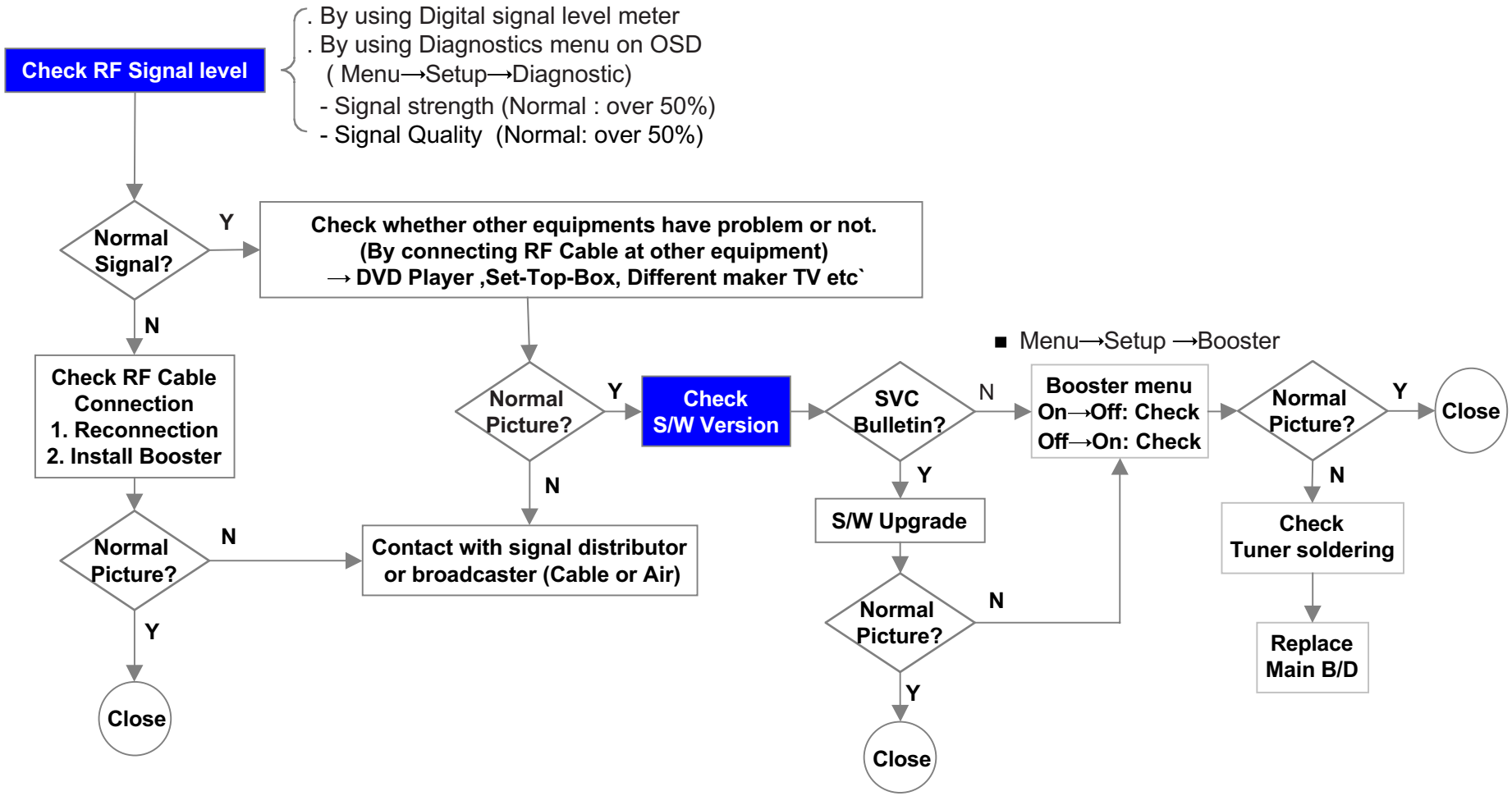
LCD TV	Error symptom	A. Picture Problem	Established date	2008. 3 .05	
		Picture broken/ Freezing	Revised date		3/13



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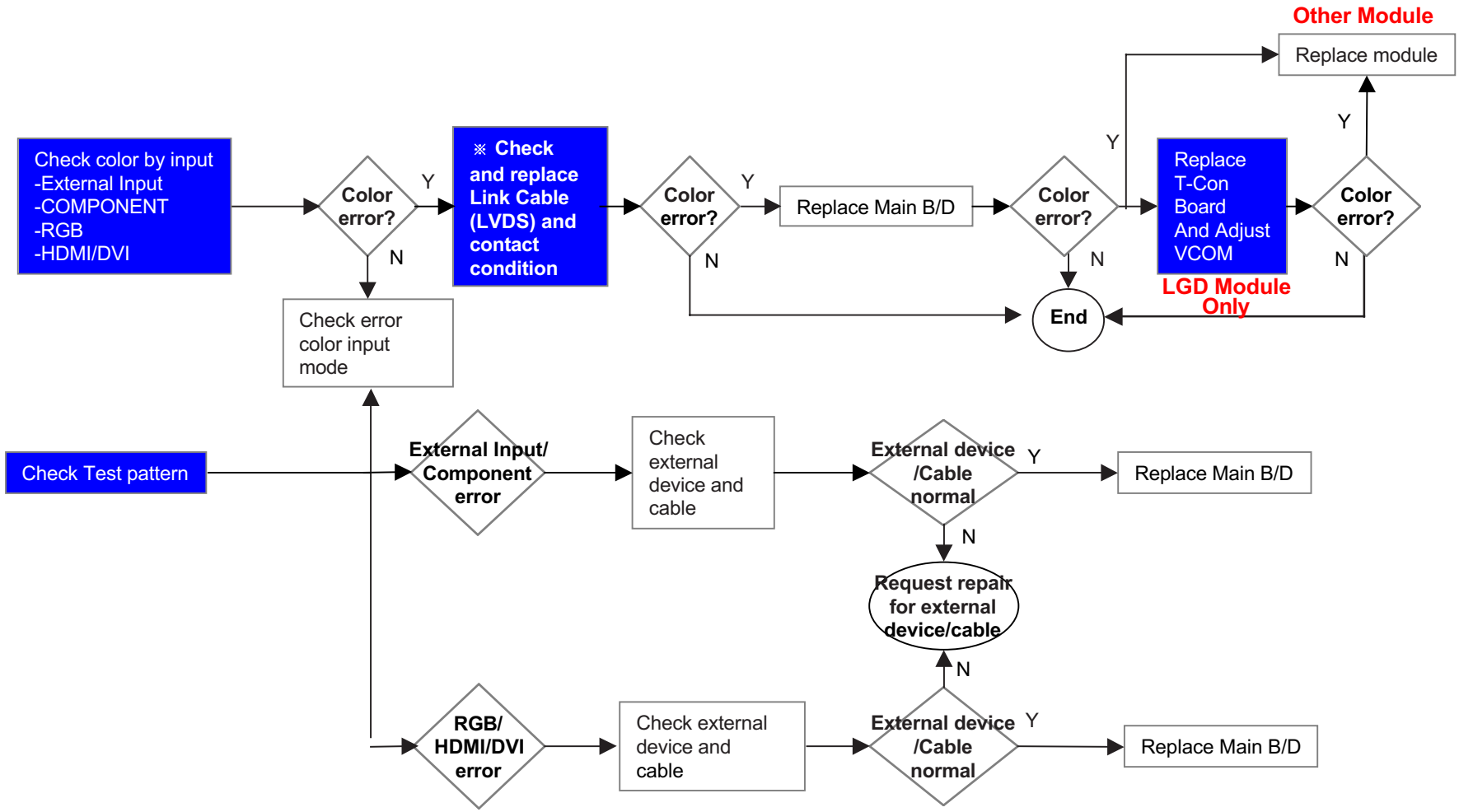
LCD TV	Error symptom	A. Video error	Established date	2008. 3 .05	
		Color error	Revised date		4/13



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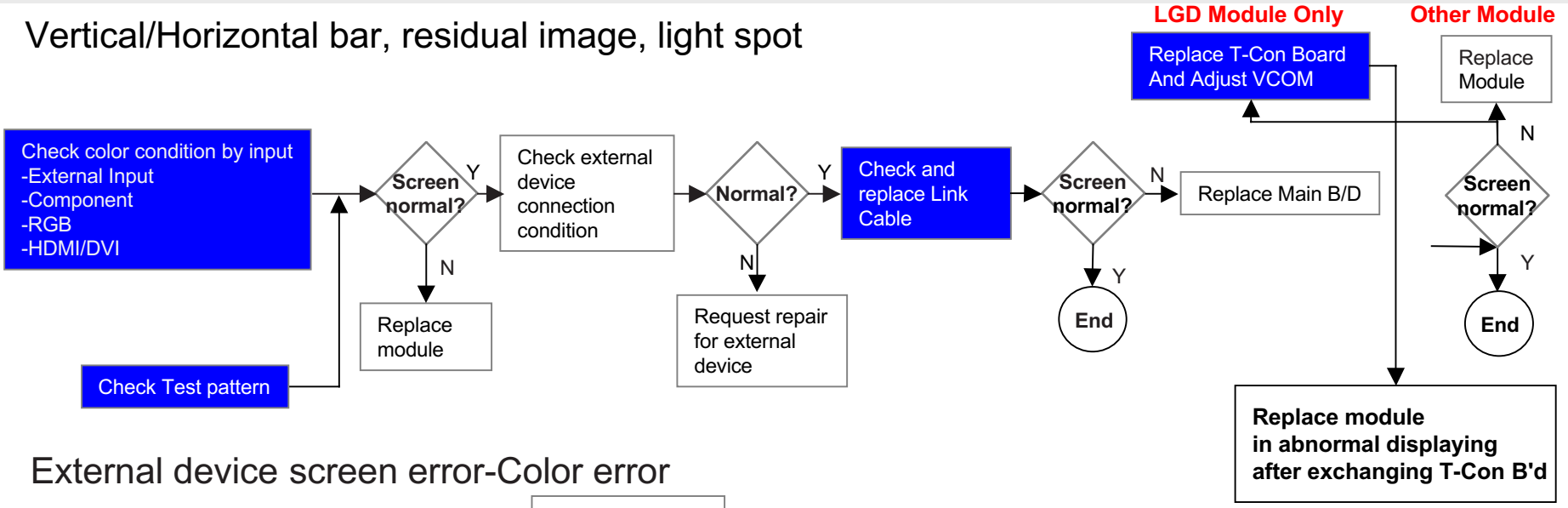
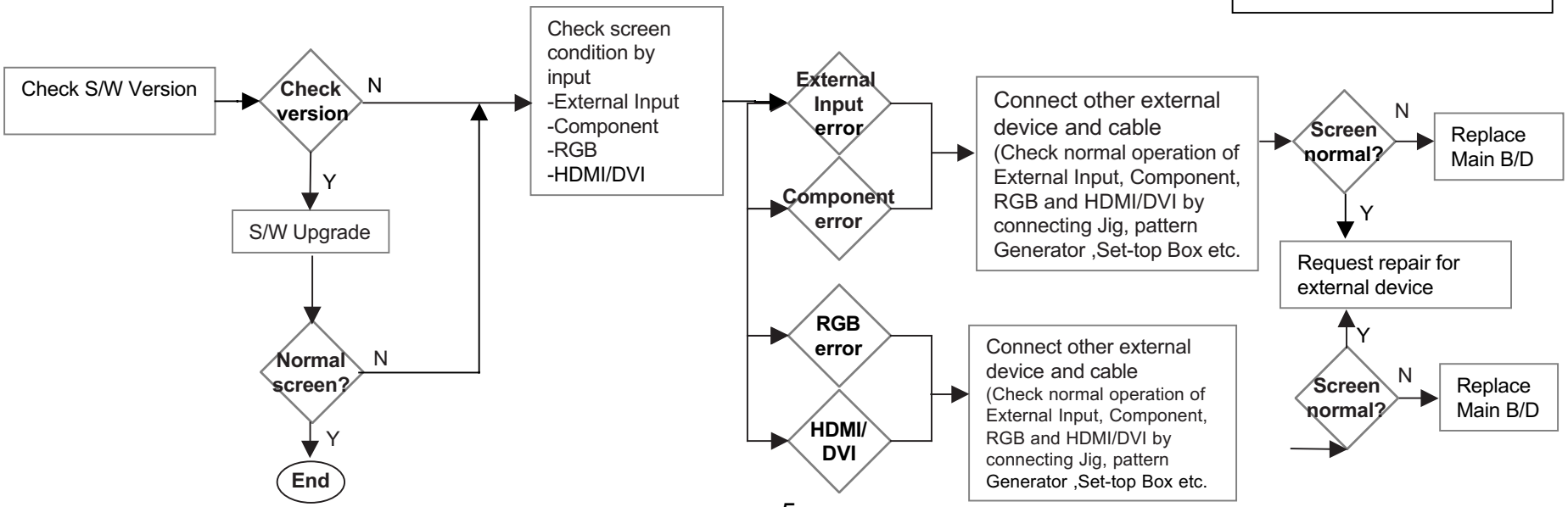
Vertical/Horizontal bar, residual image, light spot



External device screen error-Color error



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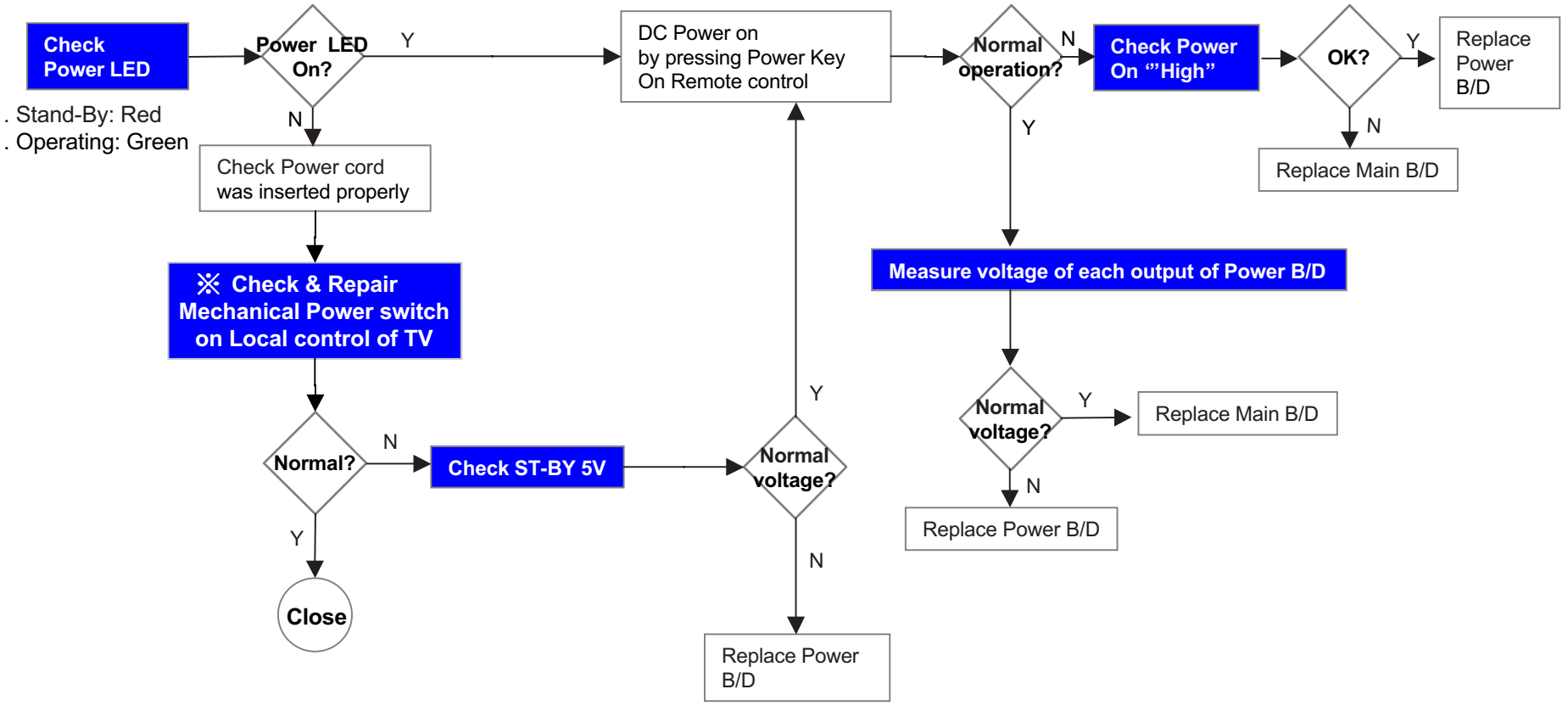
LCD TV	Error symptom	B. Power error	Established date	2008. 3 .05	
		No power	Revised date		6/13



※ **'09 years new model apply mechanical power switch to reduce power consumption in stand-by status.**
If mechanical power switch off
→ Doesn't turn on by remote control
→ Doesn't appear LED light
Please refer to the A21 Page

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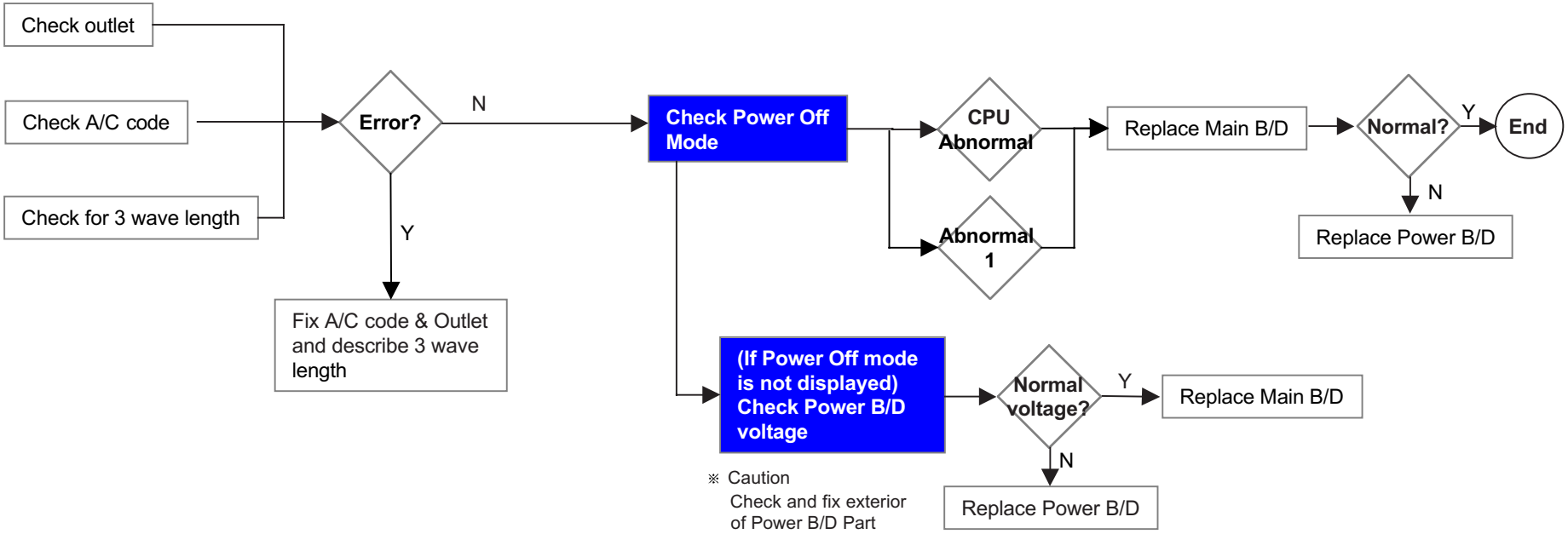
LCD TV	Error symptom	B. Power error	Established date	2008. 3 .05	
		Off when on, off while viewing, power auto on/off	Revised date		7/13



*** Please refer to the all cases which can be displayed on power off mode.**

Status	Power off List	Explanation
Normal	"POWEROFF_REMOTEKEY"	Power off by REMOTE CONTROL
	"POWEROFF_OFFTIMER"	Power off by OFF TIMER
	"POWEROFF_SLEEPTIMER"	Power off by SLEEP TIMER
	"POWEROFF_INSTOP"	Power off by INSTOP KEY
	"POWEROFF_AUTOOFF"	Power off by AUTO OFF
	"POWEROFF_ONTIMER"	Power off by ON TIMER
	"POWEROFF_RS232C"	Power off by RS232C
	"POWEROFF_RESREC"	Power off by Reservated Record
	"POWEROFF_RECEND"	Power off by End of Recording
	"POWEROFF_SWDOWN"	Power off by S/W Download
	"POWEROFF_UNKNOWN"	Power off by unknown status except listed case
Abnormal	**"POWEROFF_ABNORMAL1"**	Power off by abnormal status except CPU trouble
	"POWEROFF_CPUABNORMAL"	Power off by CPU Abnormal

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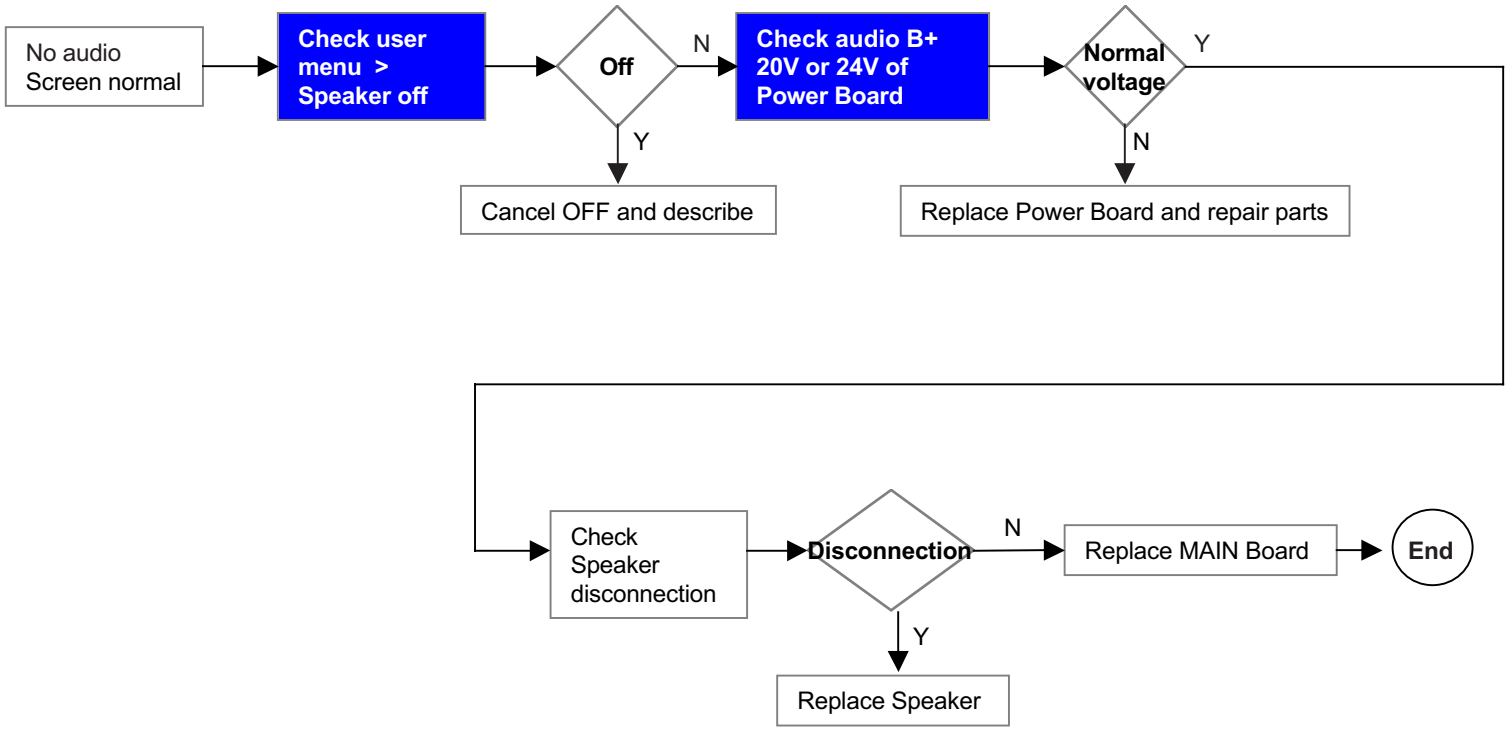
LCD TV	Error symptom	C. Audio error	Established date	2008. 3 .05	
		No audio/ Normal video	Revised date		8/13



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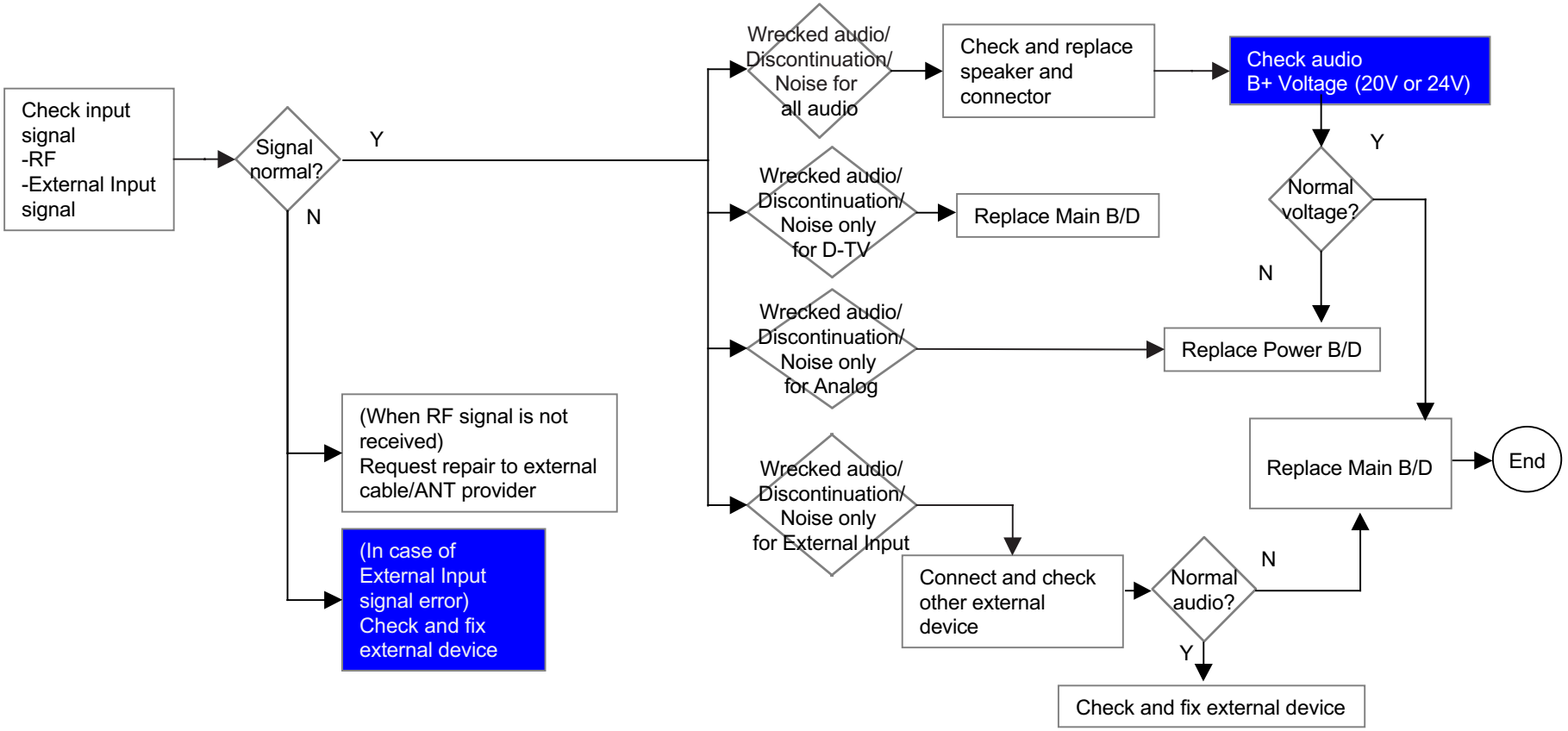
→ **Wrecked audio/discontinuation/noise is same after "Check input signal" compared to No audio**


Check input signal -RF -External Input signal
Signal normal?
Y
N
(When RF signal is not received) Request repair to external cable/ANT provider
(In case of External Input signal error) Check and fix external device
Wrecked audio/ Discontinuation/ Noise for all audio
Check and replace speaker and connector
Check audio B+ Voltage (20V or 24V)
Y
Normal voltage?
N
Wrecked audio/ Discontinuation/ Noise only for D-TV
Replace Main B/D
Wrecked audio/ Discontinuation/ Noise only for Analog
Replace Power B/D
Wrecked audio/ Discontinuation/ Noise only for External Input
Connect and check other external device
Normal audio?
N
Y
Check and fix external device
Replace Main B/D
End

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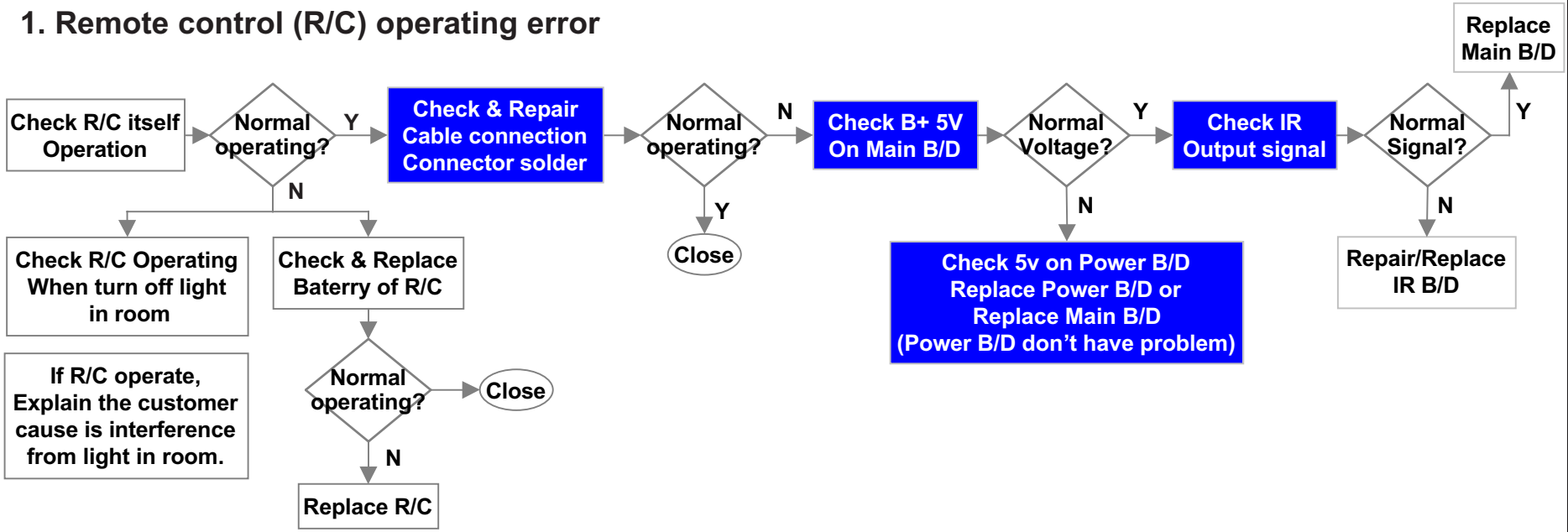
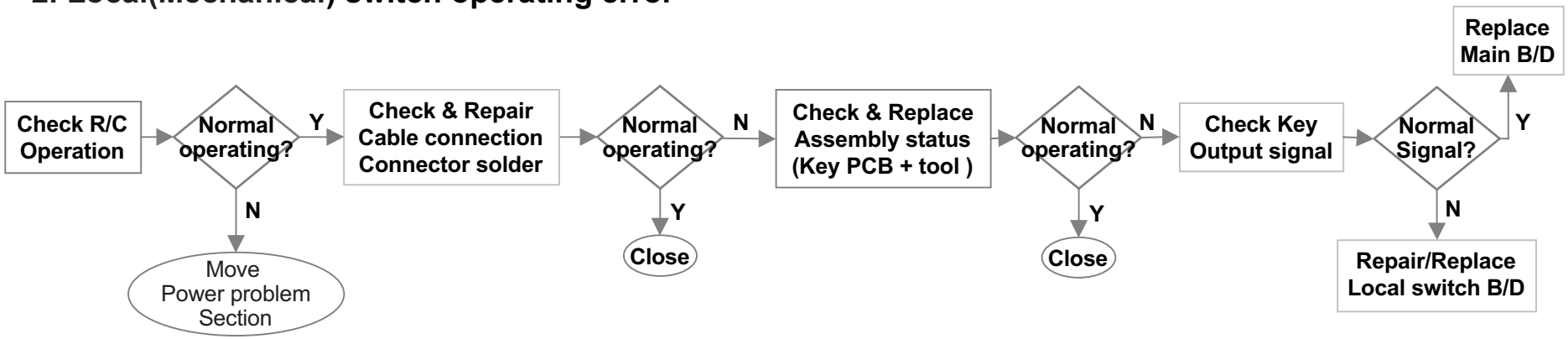
LCD TV	Error symptom	D. General Function Problem	Established date	2008. 3 .05	
		Remote control & Local switch checking	Revised date		10/13

1. Remote control (R/C) operating error



2. Local(Mechanical) switch operating error



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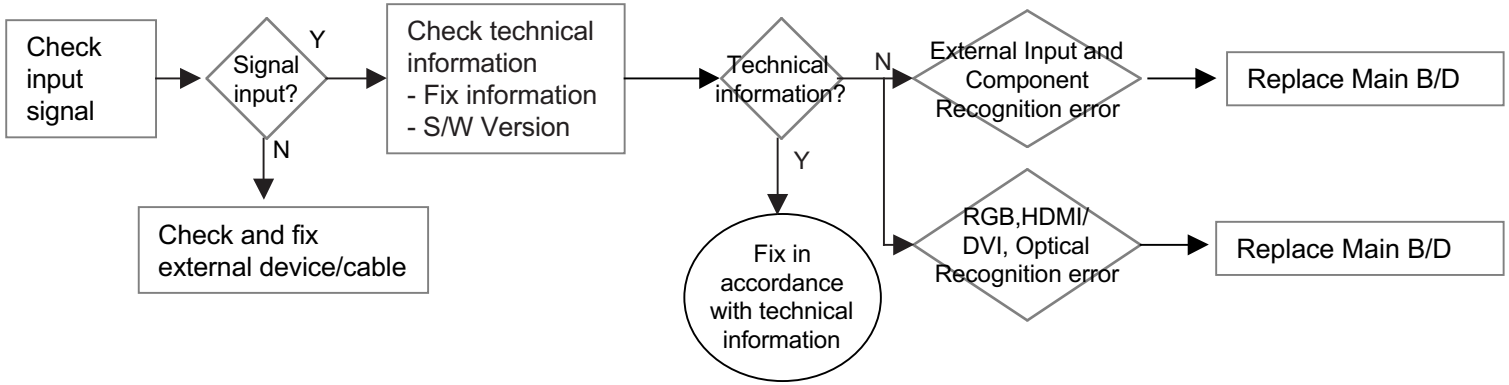
LCD TV	Error symptom	D. Function error	Established date	2008. 3 .05	
		External device recognition error	Revised date		11/13



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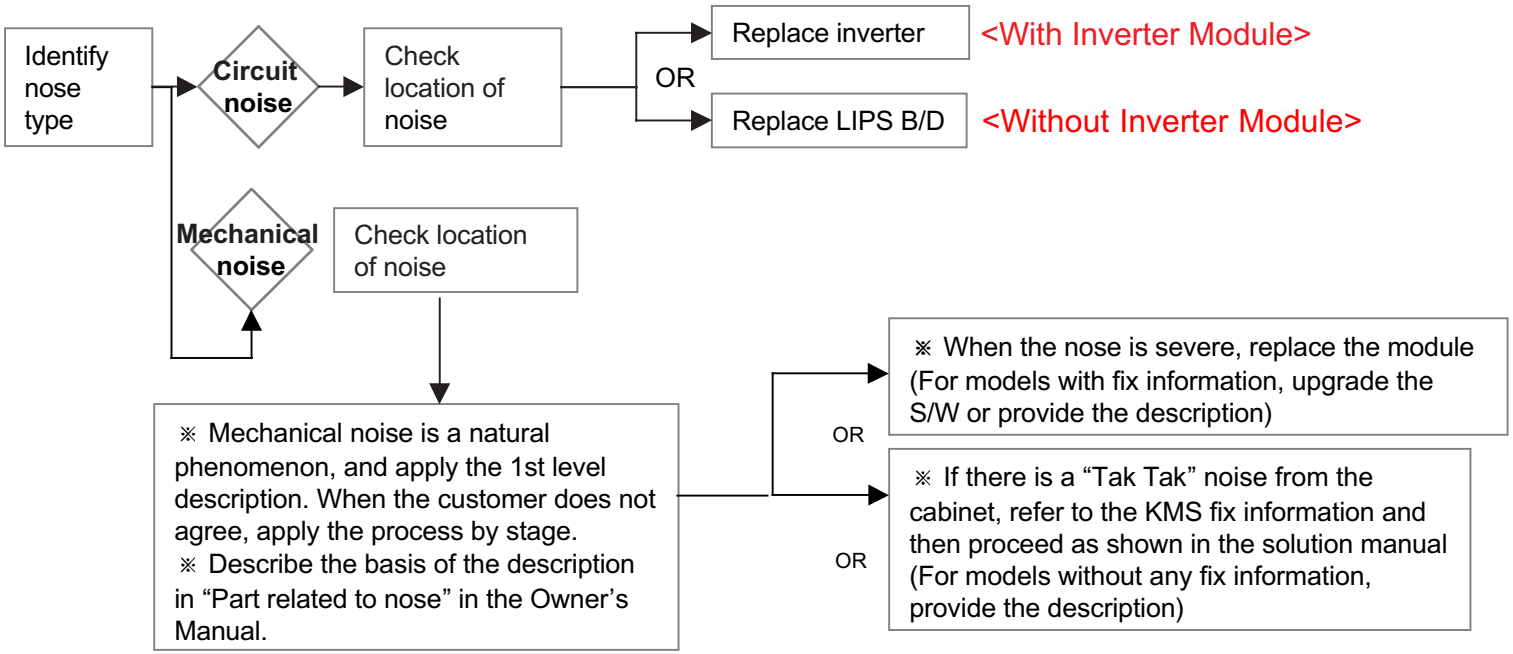
Identify nose type
Circuit noise
Check location of noise
OR
Replace inverter
<With Inverter Module>
Replace LIPS B/D
<Without Inverter Module>
Mechanical noise
Check location of noise
※ Mechanical noise is a natural phenomenon, and apply the 1st level description. When the customer does not agree, apply the process by stage.
※ Describe the basis of the description in “Part related to nose” in the Owner’s Manual.
OR
※ When the nose is severe, replace the module (For models with fix information, upgrade the S/W or provide the description)
OR
※ If there is a “Tak Tak” noise from the cabinet, refer to the KMS fix information and then proceed as shown in the solution manual (For models without any fix information, provide the description)

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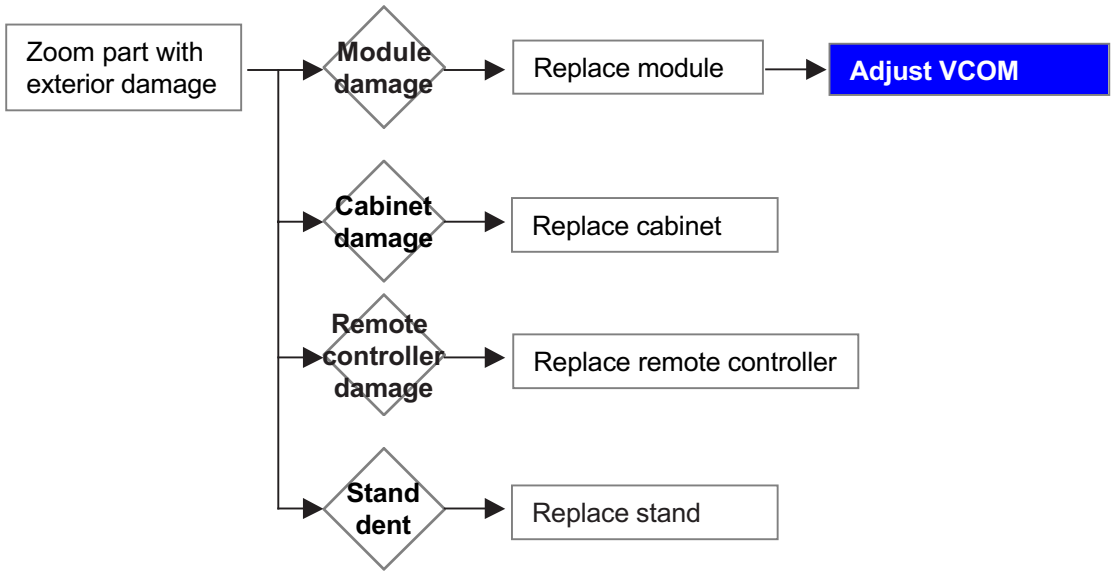
LCD TV	Error symptom	F. Exterior defect	Established date	2008. 3 .05	
		Exterior defect	Revised date		13/13



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LCD TV Repair Process Index

- Trouble shooting by input block (Component level check)

No.	Symptom (L)	Input Block	Page	Remark
1	Power Problem	Power-up Boot fail	1~2	
2	Video Problem	No OSD	3~4	
3		Digital TV	5	
4		Analog TV	6	
5		AV (Scart / CVBS/ S-Video)	7~12	
6		Component	13	
7		RGB(D-SUB)	14~15	
8		HDMI	16~17	
9	Audio Problem	All Input	18	
10		Digital TV	19	
11		Analog TV	20	
12		AV / Component / RGB, HDMI-PC/ HDMI-DTV	21~26	
13		AV Audio out / No Audio (Headphone & SPDIF)	27~30	
14	USB / Remocon Problem	USB no connect / Remocon	31~33	
15	Intelligent Sensor	Intelligent Sensor	34	

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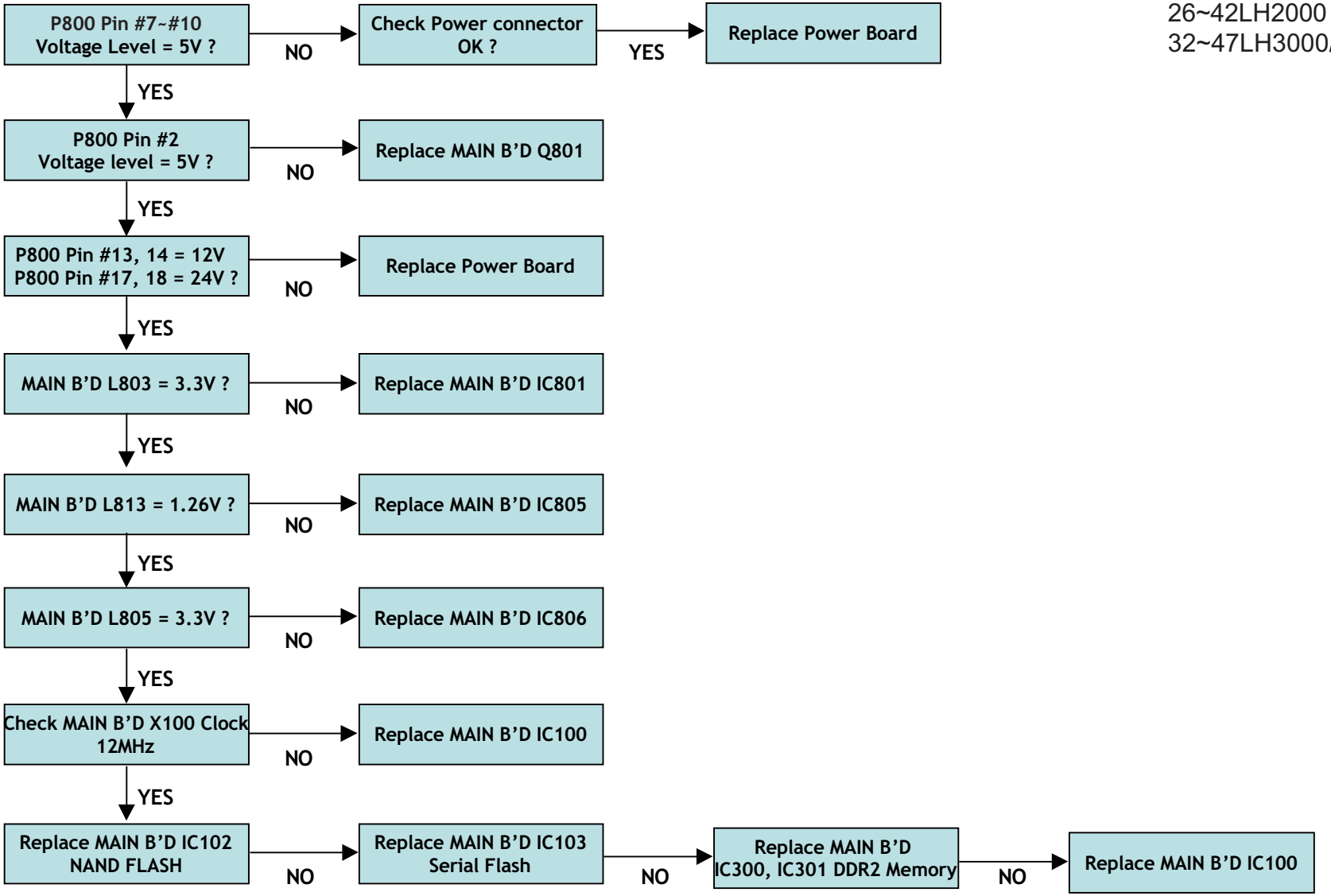
LCD TV	Symptom	Power-Up Boot Fail	Making	2009. 2 . 1	
			Revision		1/34

26~42LH2000
32~47LH3000/LH4000



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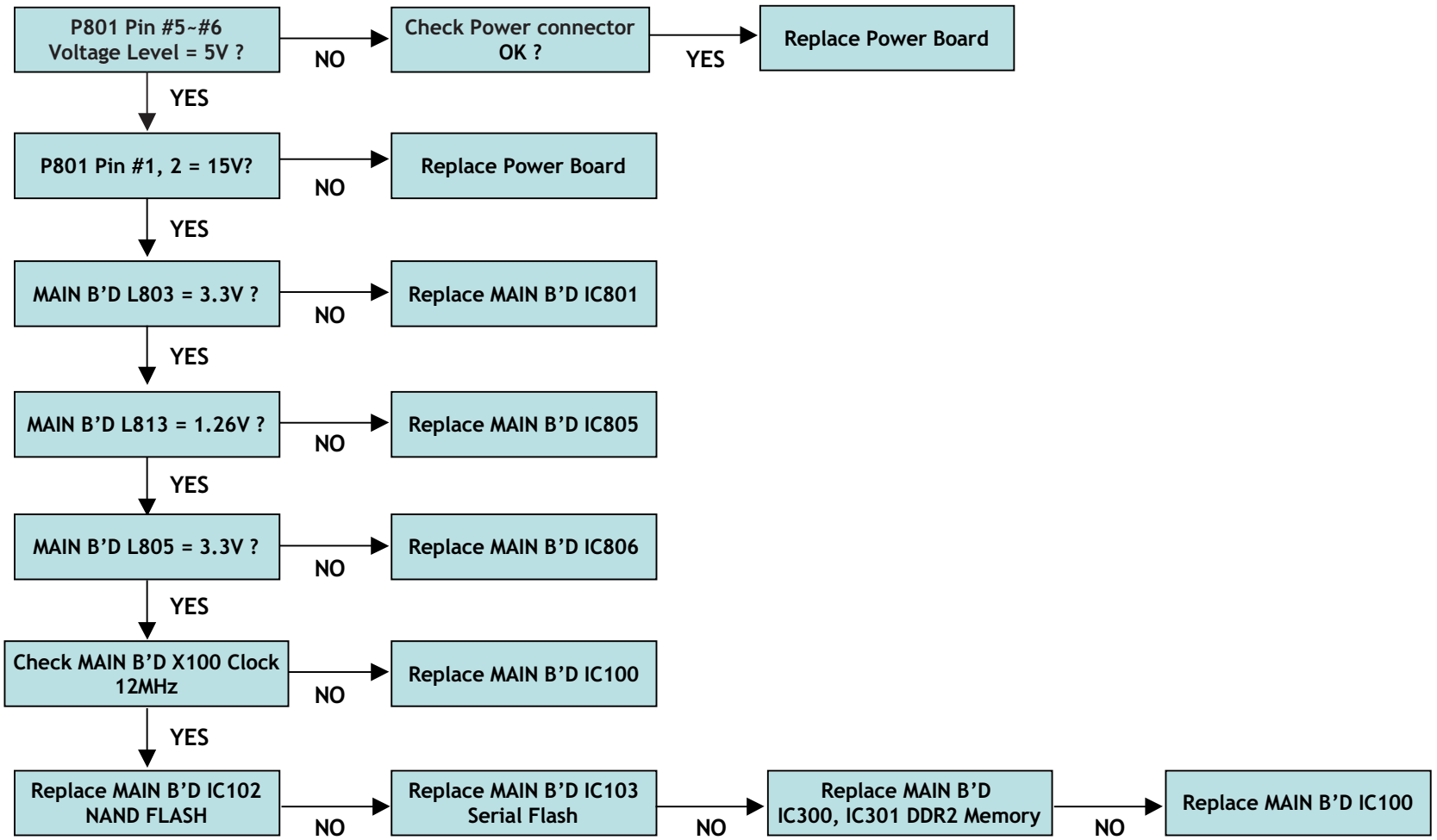
19~22LH2000



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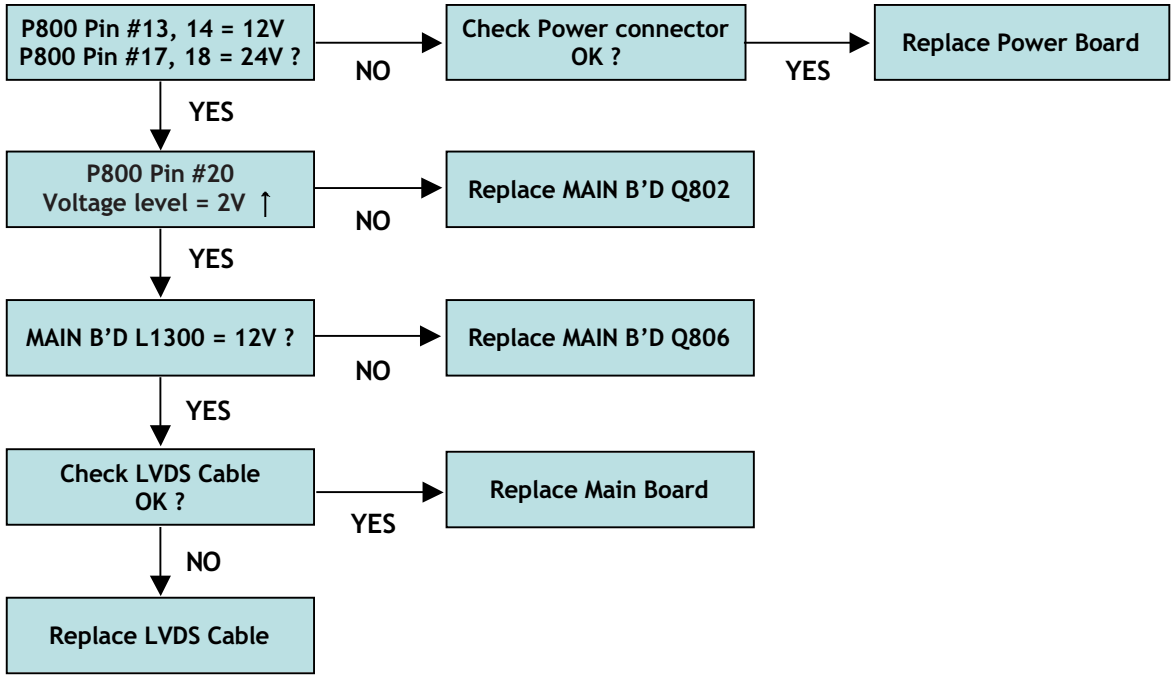
26~42LH2000
32~47LH3000/LH4000



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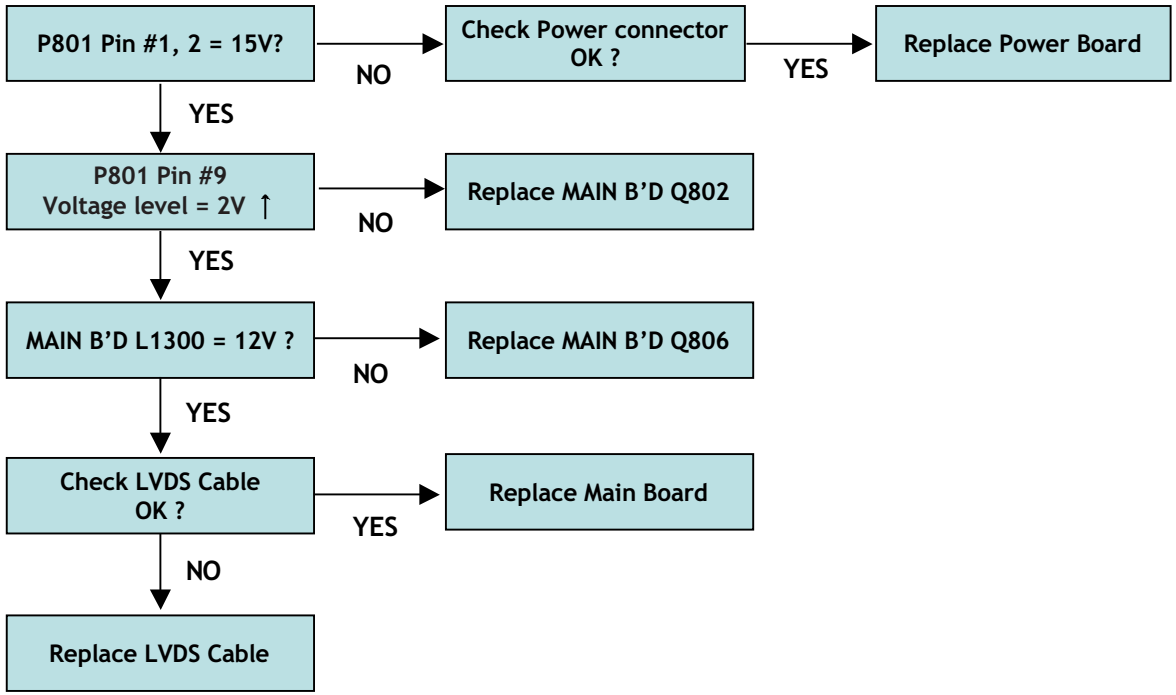
19~22LH2000



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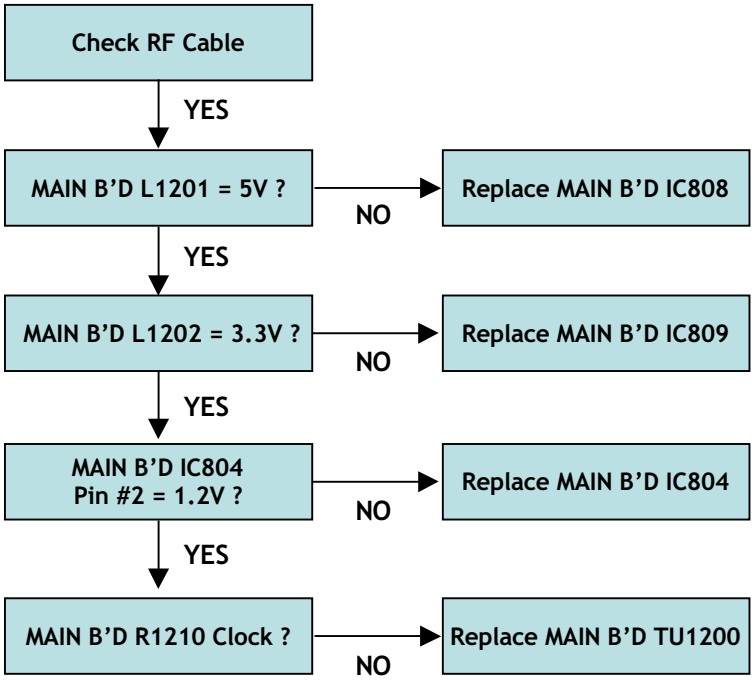
26~42LH2000
32~47LH3000/LH4000



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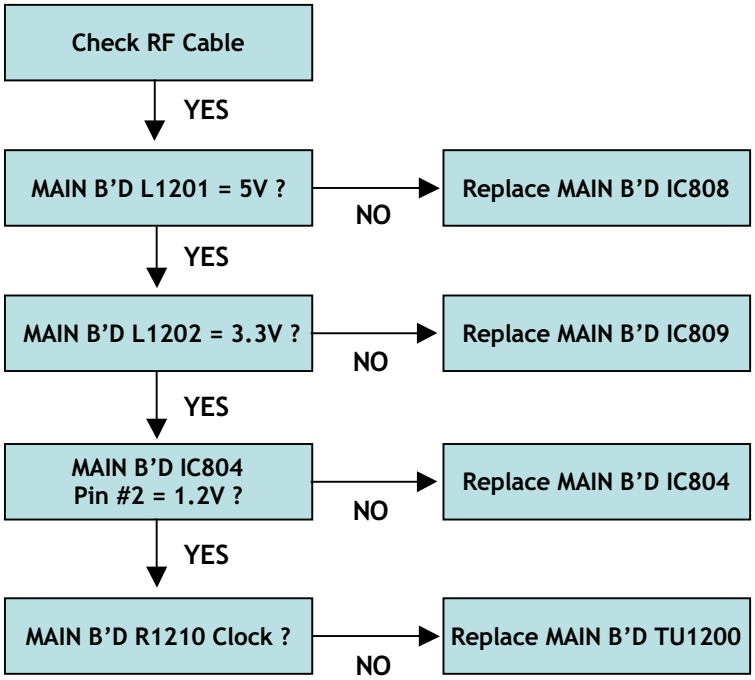
26~42LH2000
32~47LH3000/LH4000



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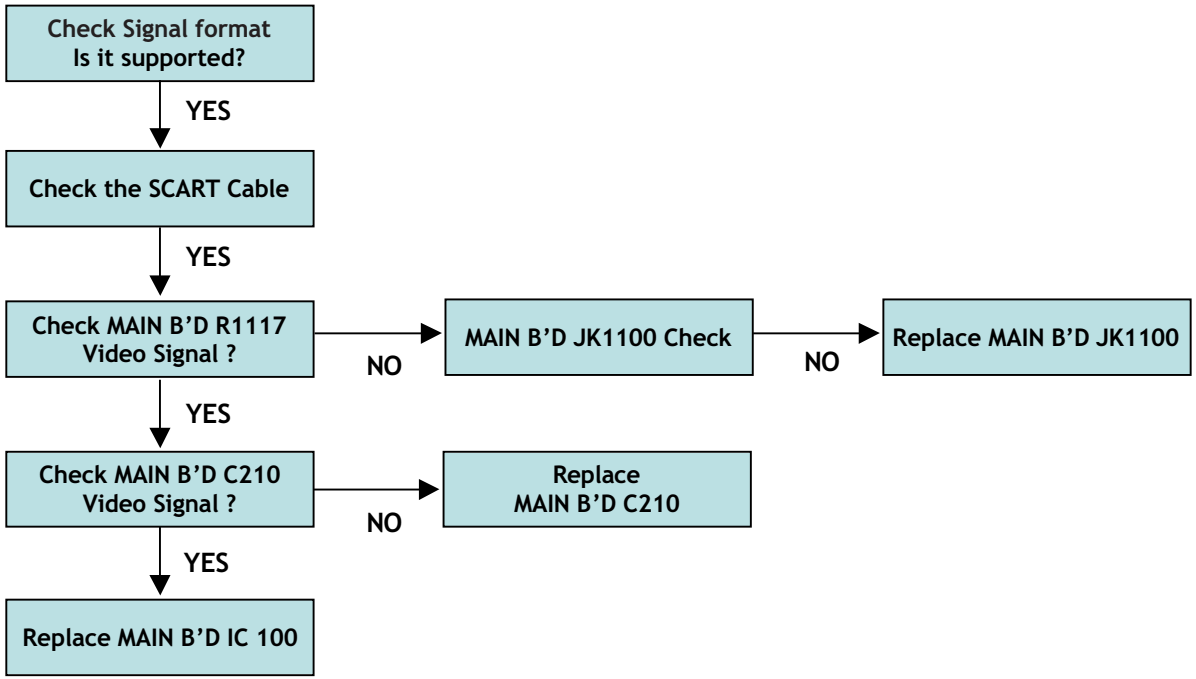
26~42LH2000
32~47LH3000/LH4000



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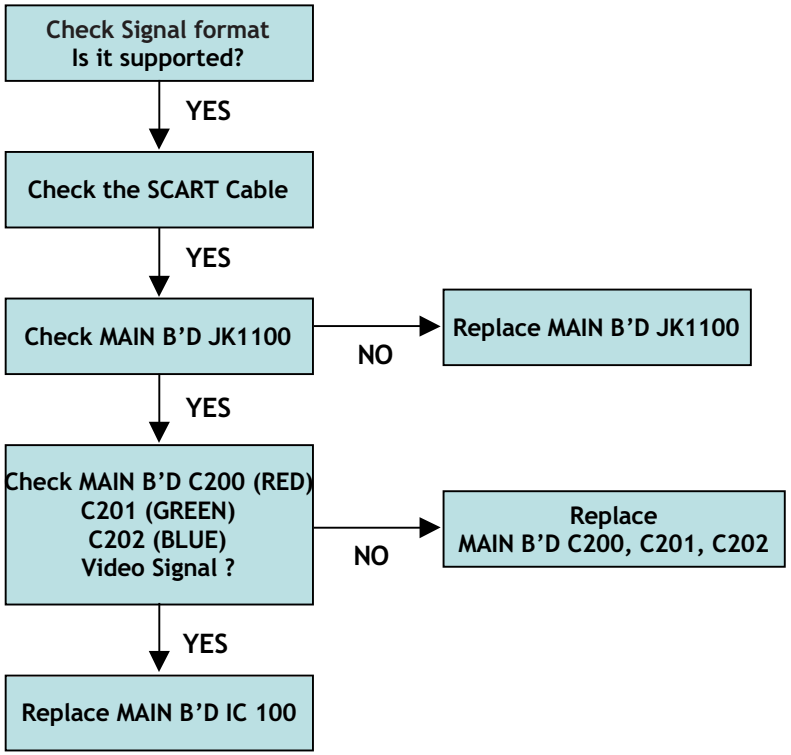

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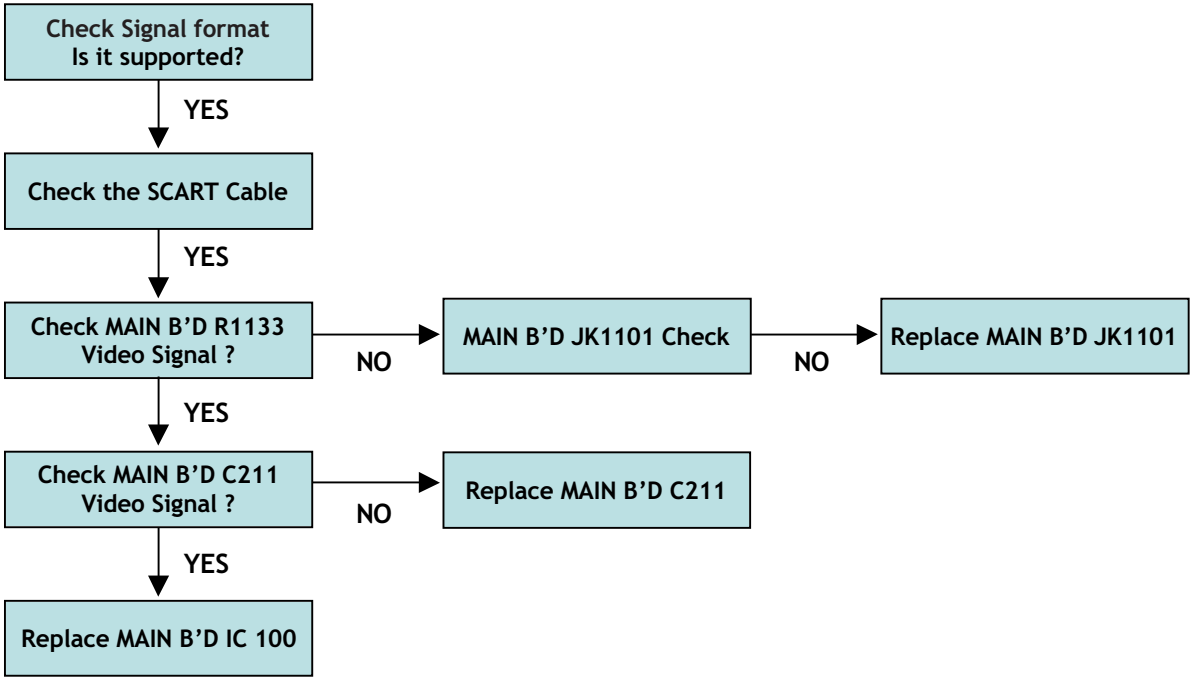

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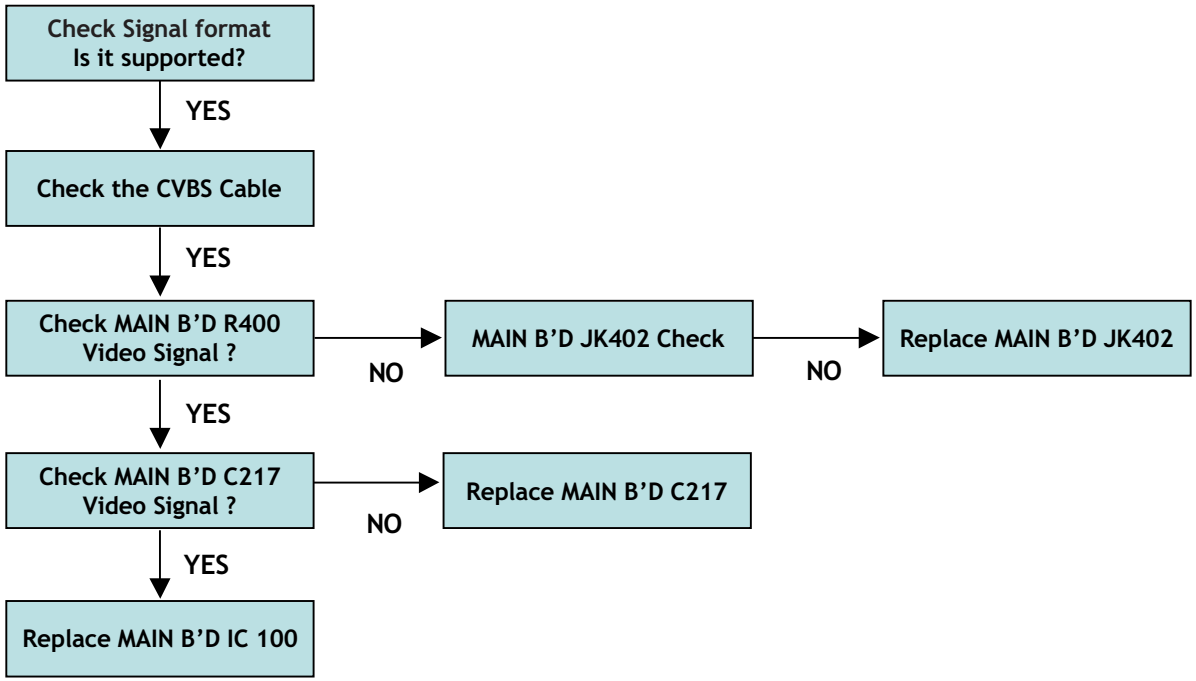

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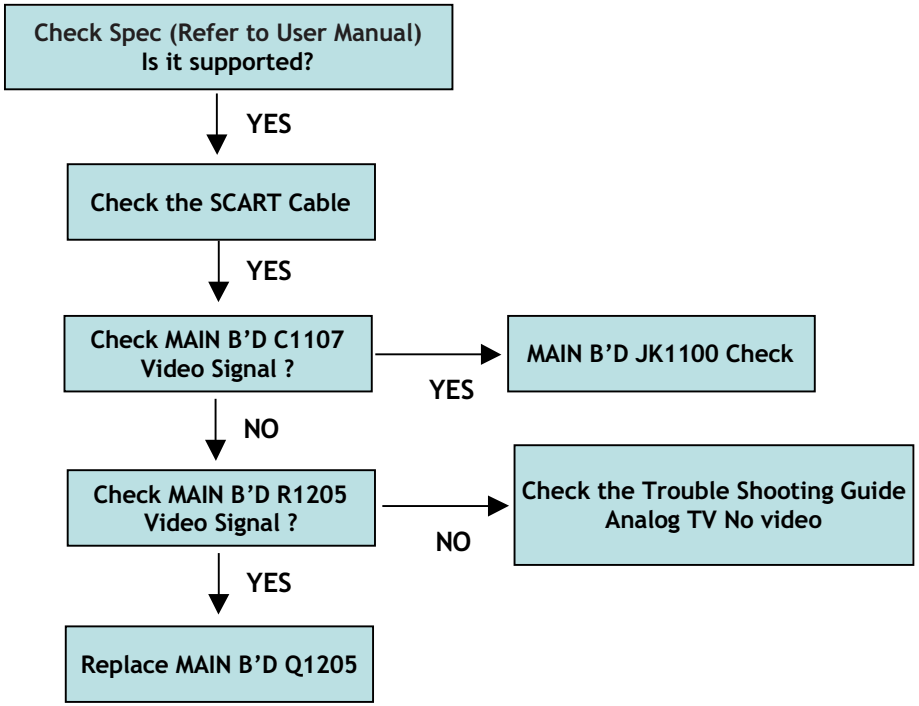

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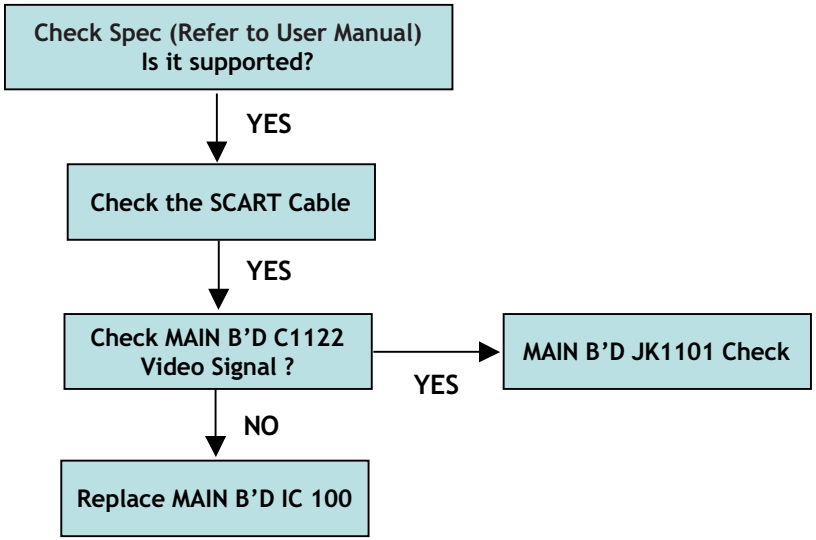

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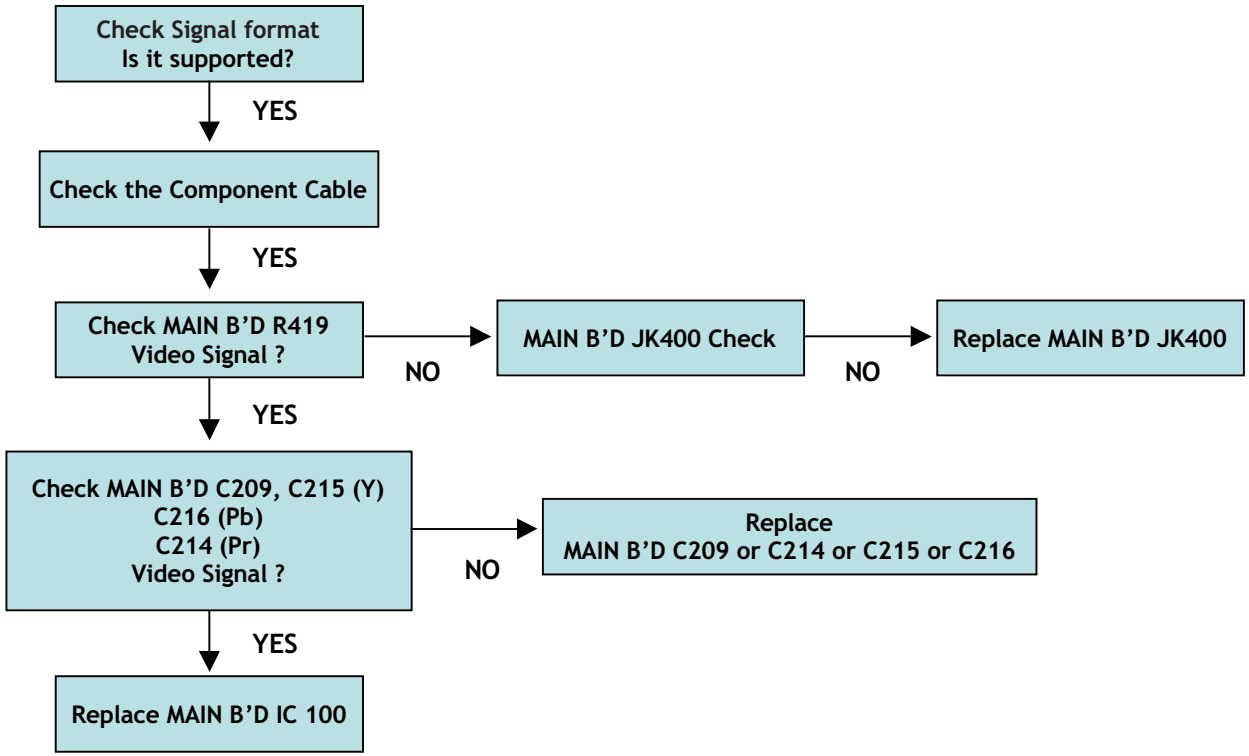

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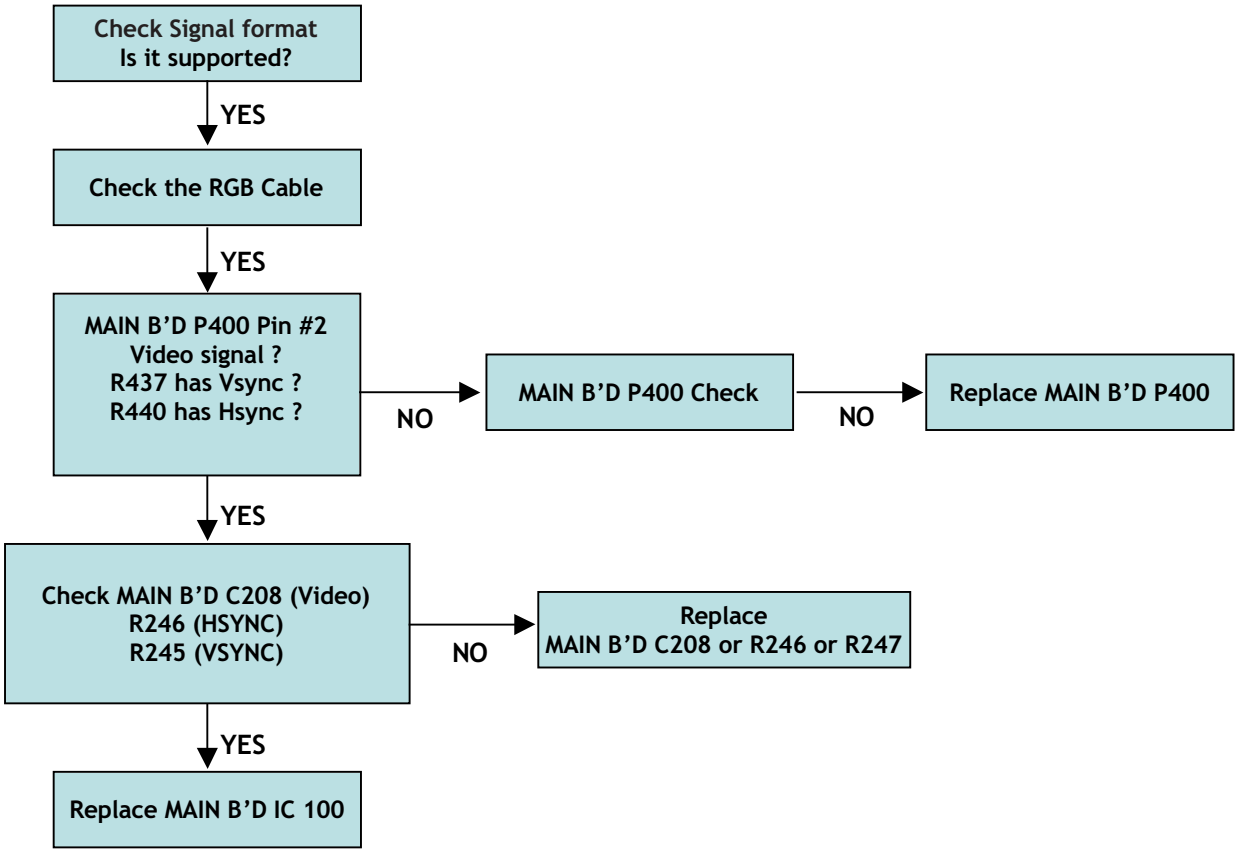

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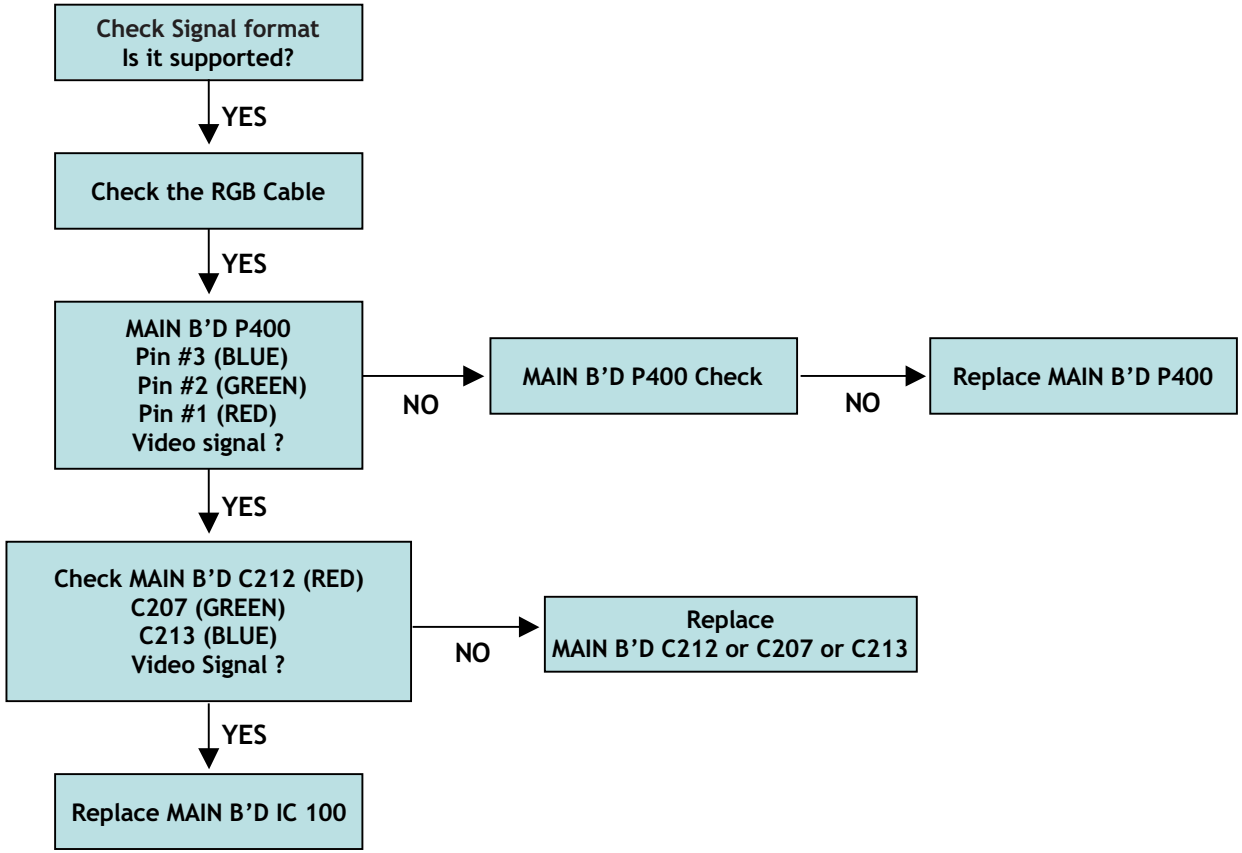

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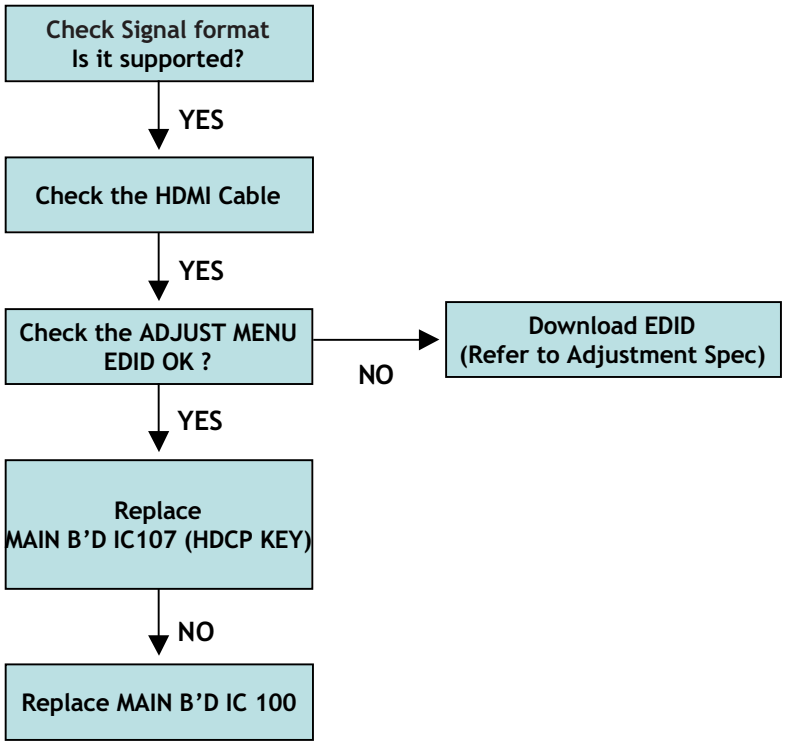

HDMI1 – ALL MODELS
HDMI2 – Except for 19/22LH20**
HDMI3 – Except for 19/22LU40**, 19/22LU50**, 19/22LH20**

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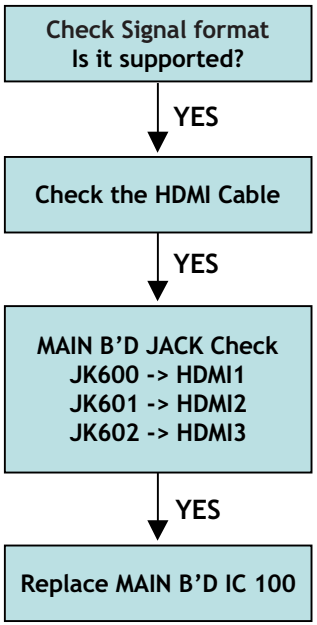

_ This case is that HDMI Video doesn't display at the some HDMI input, not all.

HDMI1 – ALL MODELS
HDMI2 – Except for 19/22LH20**
HDMI3 – Except for 19/22LU40**, 19/22LU50**, 19/22LH20**

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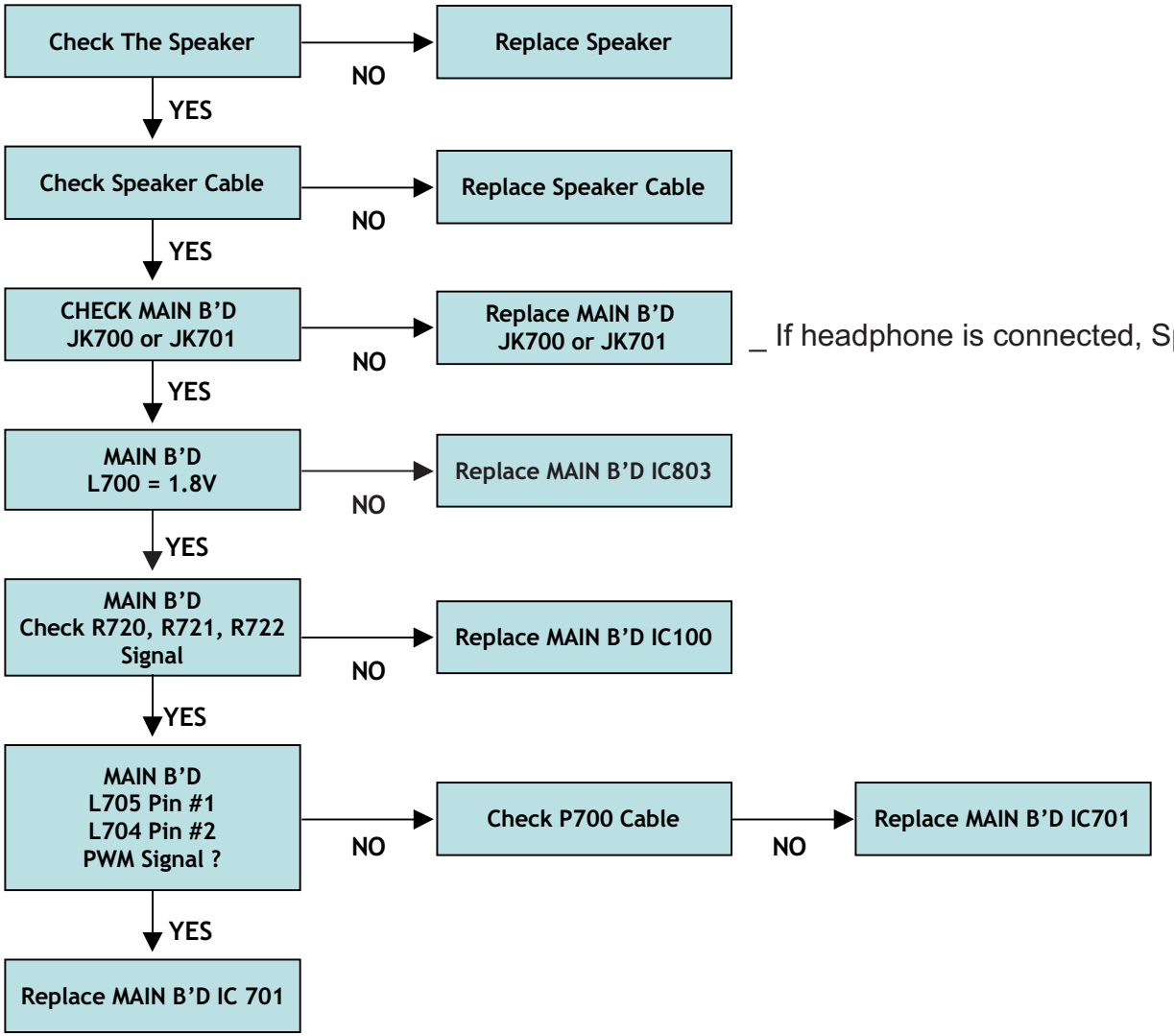

_ If headphone is connected, Speaker sound doesn't work.

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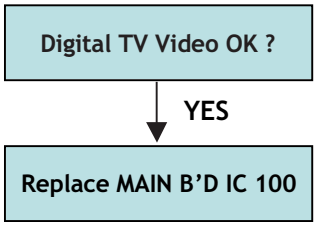

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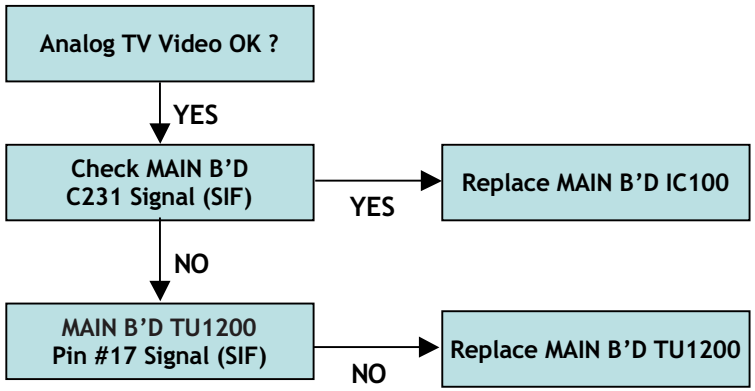

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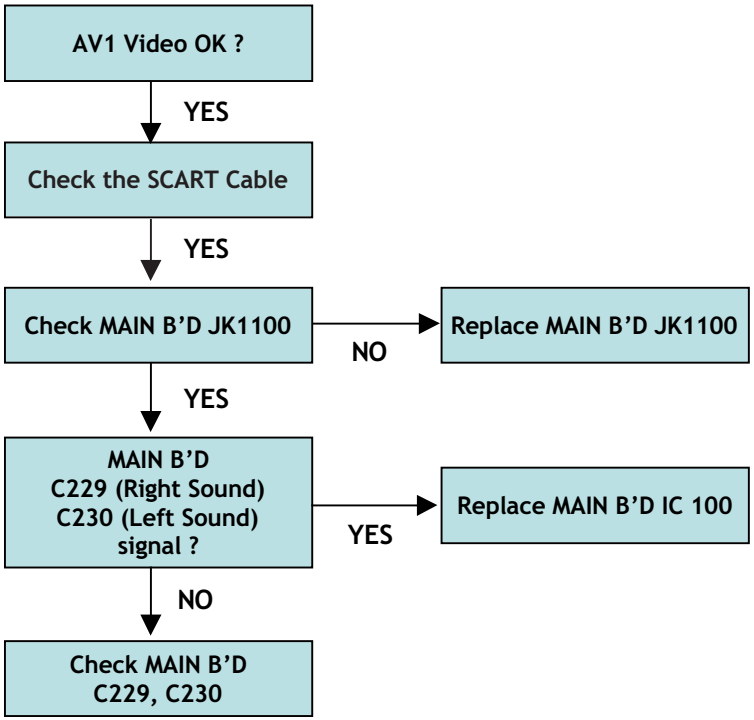

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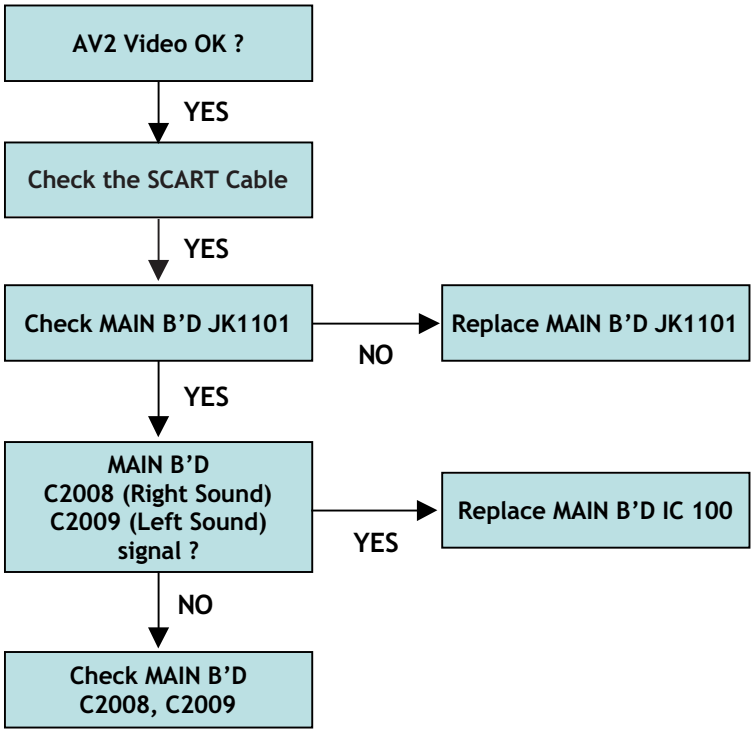

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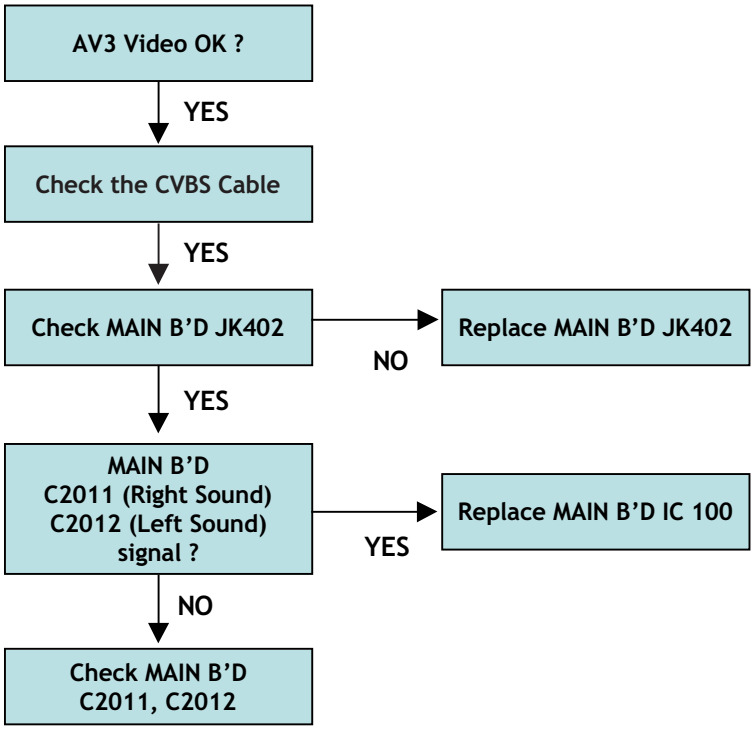

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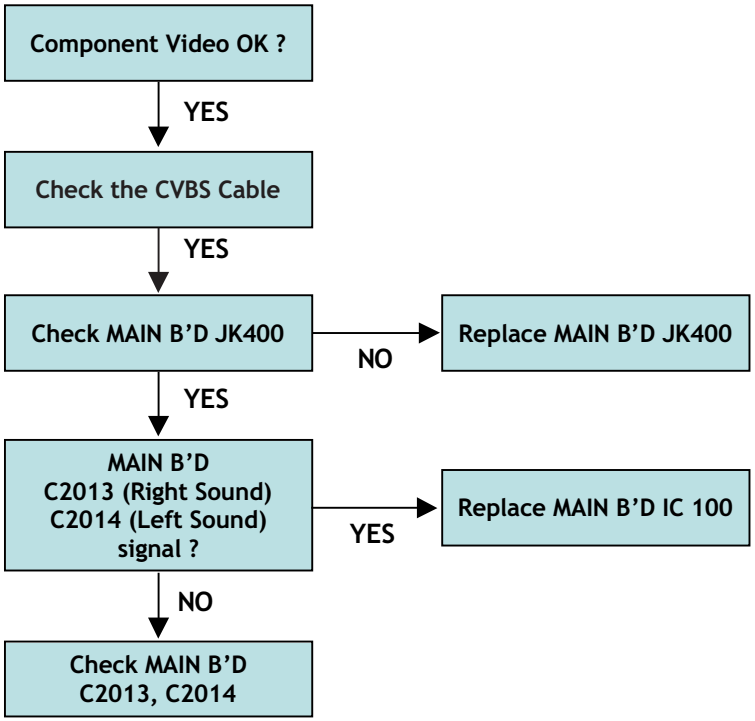

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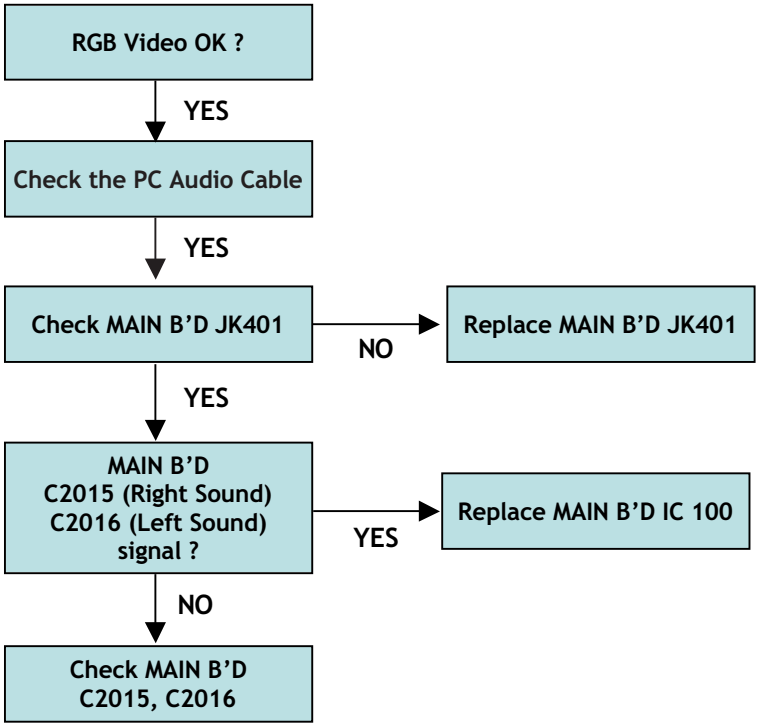

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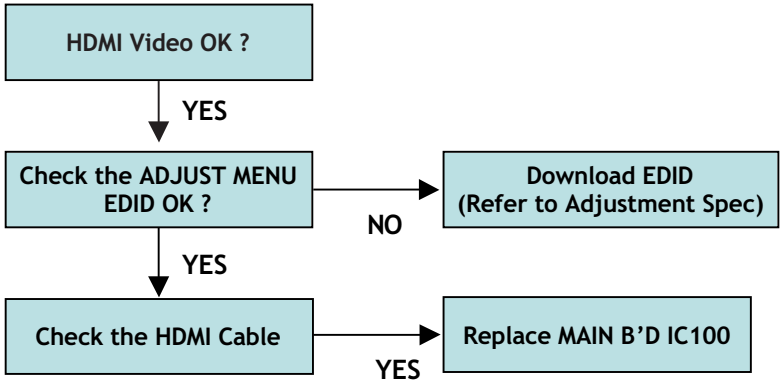

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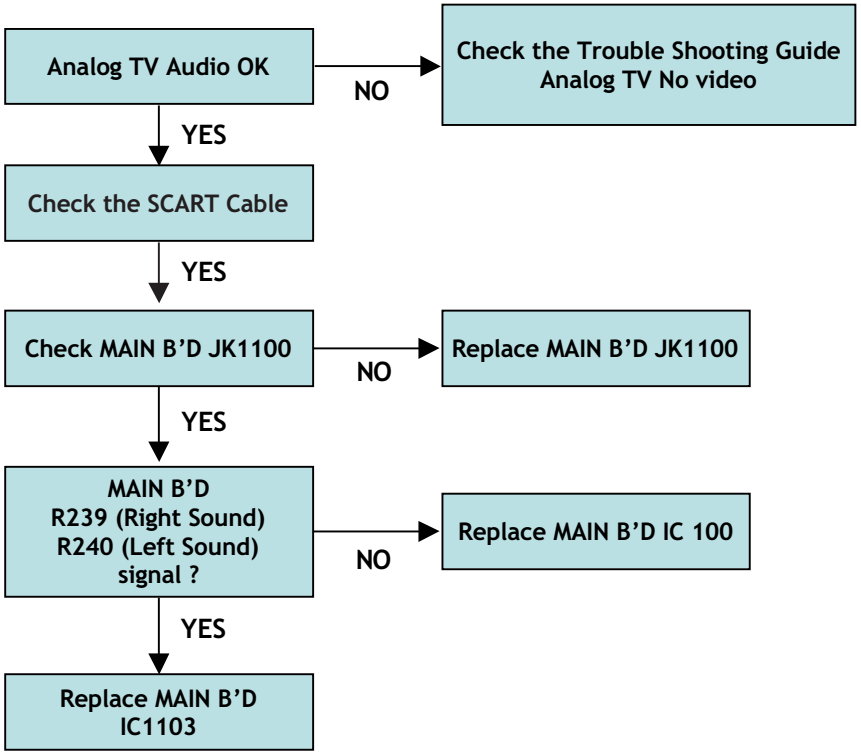

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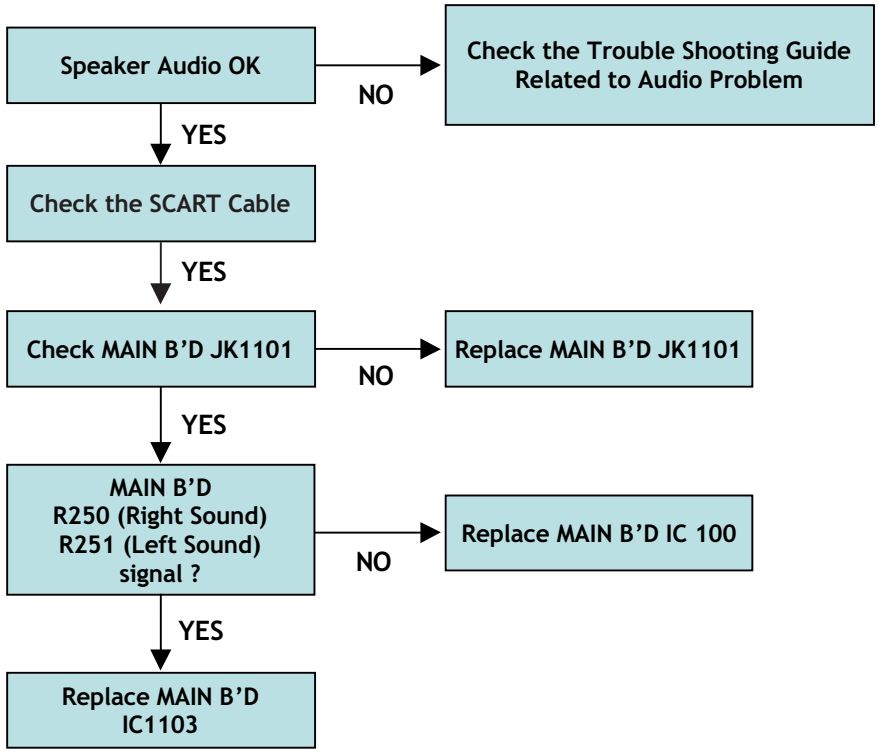

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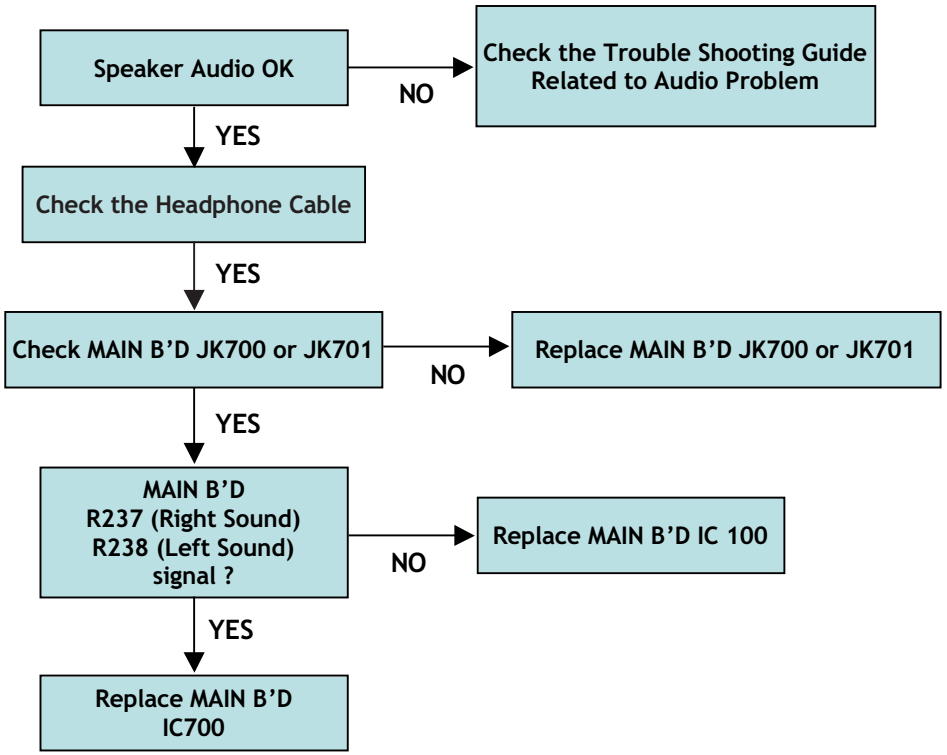

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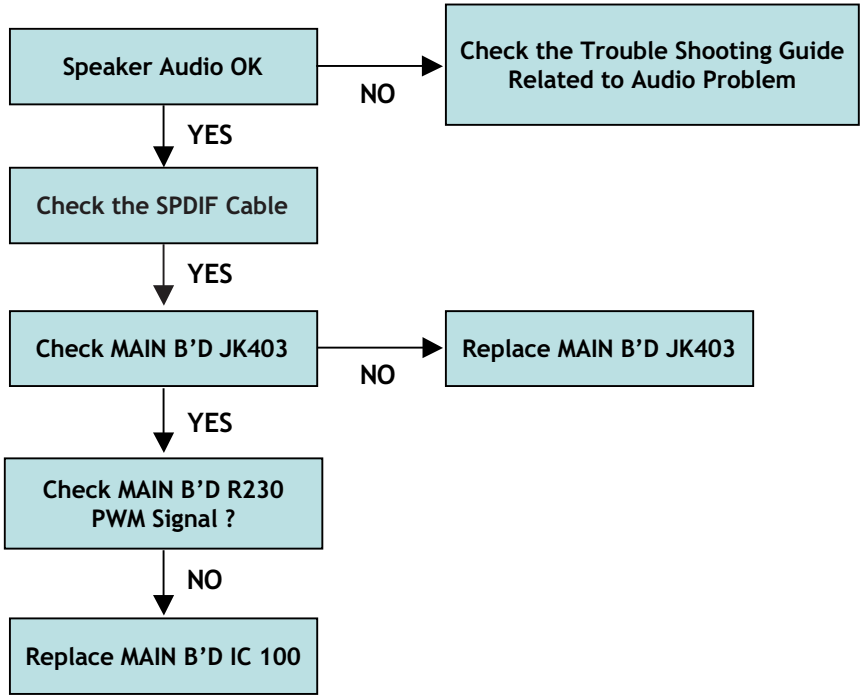

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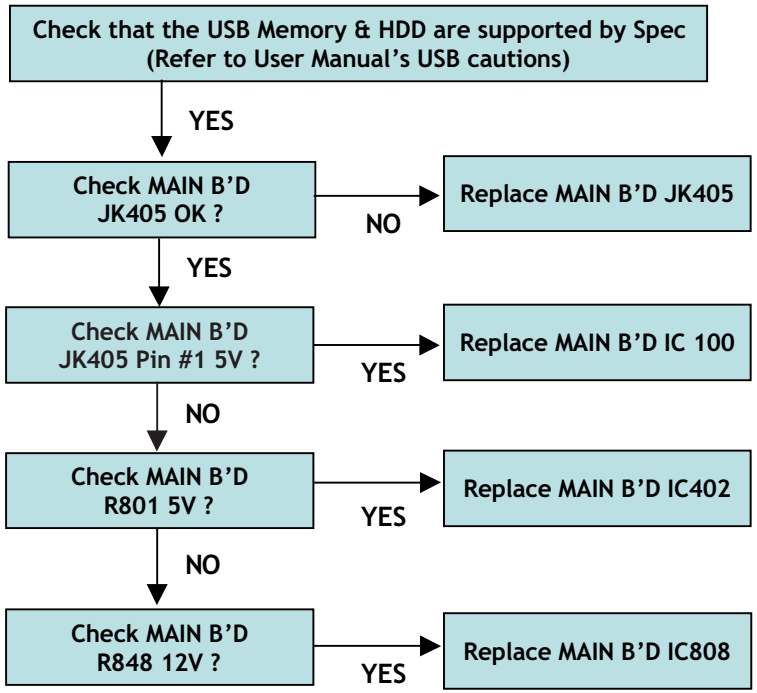
Check that the USB Memory & HDD are supported by Spec (Refer to User Manual's USB cautions)
YES
Check MAIN B'D JK405 OK ?
NO
Replace MAIN B'D JK405
YES
Check MAIN B'D JK405 Pin #1 5V ?
YES
Replace MAIN B'D IC 100
NO
Check MAIN B'D R801 5V ?
YES
Replace MAIN B'D IC402
NO
Check MAIN B'D R848 12V ?
YES
Replace MAIN B'D IC808

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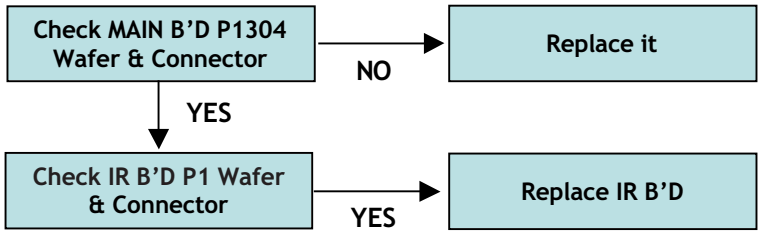

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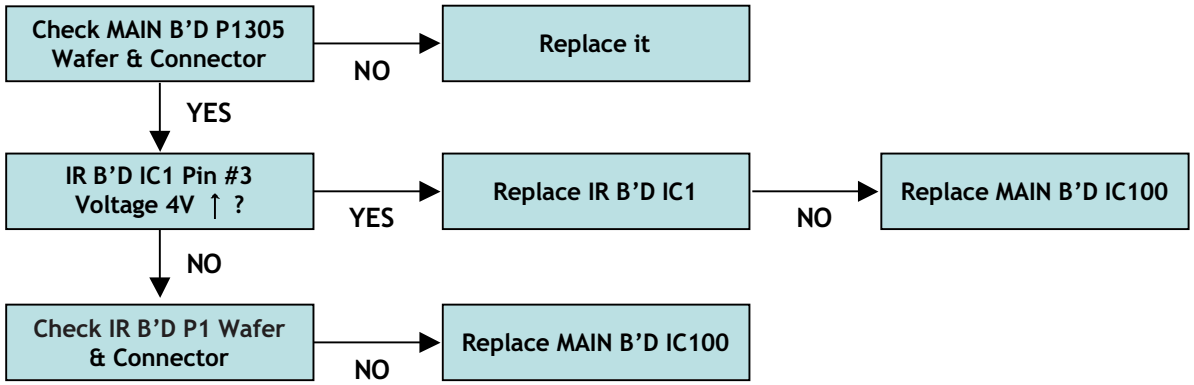

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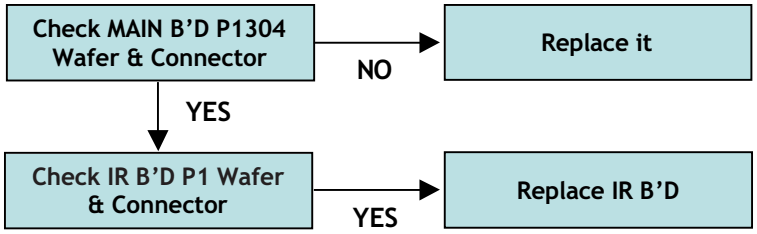

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